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SOVIET AIR ASSAULT BRIGADE

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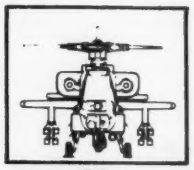

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Cover: Deep strikes in the NATO rear areas can be accomplished by airborne, air assault, amphibious assault, Spetsnaz forces or any combination; but air assault can be the most threatening because of its quick response of heavily armed helicopters escorting men and equipment to a strategic location. See page 2.

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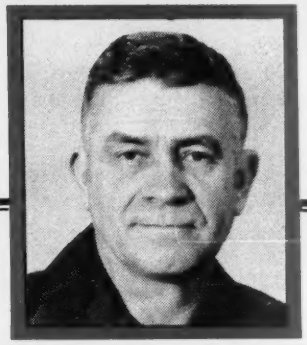
Major General Ellis D. Parker
Chief, Army Aviation Branch



Primary Flight Training

THOROUGH TRAINING done in the safest possible manner is the prime objective of all programs of instruction (POIs) used by the Army Aviation School at Ft. Rucker, AL. It is our constant ambition to find ways to ensure that what is required for safety and what is necessary to train effectively are compatible in every respect.

Meeting that goal was the purpose behind changes made this fiscal year to the 8-week primary flight training portion of the Initial Entry Rotary Wing (IERW) aviator course. As a result, the number of solo student accidents has been dramatically reduced, and more effective learning is occurring because the boredom of flying solely in the traffic pattern has been reduced.

Previously, IERW primary students could solo as soon as they had 12 flight hours in the TH-55A Osage. Also, many instructors had three students to teach. The safety improvement came when the window for solo flight was delayed to a minimum of 21.6 hours; also, the number of students a contractor instructor can work with was changed from three to two. Under the previous arrangements, we sustained one Class A and five Class C or D accidents in 1984 that were attributed to the loss of aircraft control by solo students. Since the changes were made, there have been no such accidents or incidents.

Student motivation and rate of learning improved with the introduction of confined area, slope landings and pinnacle operations in the tasks required to be taught. Making approaches at approved confined areas and pinnacles, and performing slope landings effectively provide the students with continuous challenges. Their interest stays at a peak, rather than being dulled by the boring occupation of flying 50 hours in traffic patterns. The changed POI also improves the students' ability to plan and judge, since they must consider winds, barriers and obstacles, forced landings and uneven landing terrain that are different from those in a sterile stagefield environment.

Other POI changes for primary flight training included: primary phase completion at 50 flight hours instead of on a proficiency basis, presolo flight evaluation by a standardization instructor pilot or equivalent for early identification of marginal students, and the introduction of "buddy riding."

Buddy riding is when a student rides in the left seat of the aircraft while another student is performing solo flight. The left seat student logs "Z" time on the DA Form 2408-12, and duties include clearing the aircraft in turns and being observant when in-flight for potential safety problems. Only in cases of pilot incapacitation may the buddy rider take control of the aircraft. This program is intended to make the TH-55 fly the same as when the instructor is in the left seat, to allow the buddy rider to gain additional insights in flying technique by observing the solo pilot, and to improve solo flight safety.

As you can perceive, the student aviators are now safer while they are flying a more interesting program of instruction in the primary phase. That means we are laying a better foundation for the rest of the IERW course.

SOVIET AIR ASSAULT BRIGADE

PART I: ORIGINS

This month we welcome two guest authors to the Threat Section, which we normally prepare at the Aviation Center's Directorate of Combat Developments. At a time when Soviet helicopter forces are receiving priority attention within the Soviet Union, Lieutenant Colonel (P) Jack E. Easton and Major (P) Charles B. Cook take an indepth look at the Soviet air assault brigade. Part I covers its origins. Next month Part II discusses the brigade's employment.

Major Julius Zebehazy
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MONTHLY WRITING AWARD

Lieutenant Colonel (P) Jack E. Easton
Major (P) Charles B. Cook

Within the past 20 years, the Soviets have revised their traditional view that the helicopter is capable only of marginal gains in combat power. Since 1974, the Soviets have modernized, restructured and strengthened their entire combat helicopter force. It is a powerful new component of the Soviet combined arms concept that enhances an already impressive Soviet military force—impressive not only in quantity but also in quality. With the exploitation of the helicopter force structure and concurrent Soviet air assault doctrine, a number of questions arise. For example:

- How would a Soviet commander organized for combat in a theatre of military operations in Western Europe plan the military strategy for these units?
- What operational role would these units assume?
- Is the Soviet Front or army level of employment and control flexible enough to allow for success?
- How routinely will Soviet air assault forces be committed during the next war?
- Will Soviet air assault forces seize the necessary critical objectives in conjunction with their massive breakthrough operations, thus expediting the tempo of their 30 to 50 kilometer per day scenarios?
- How successfully will Soviet attack helicopters free Soviet tactical fighters for increased interdiction/air superiority operations?
- Will these air assault forces necessarily have to link up with advancing ground forces in order to survive?

Historical Conceptualization

The Problem. The United States spent one decade in Vietnam involved in an unconventional war, and spent most of another decade readjusting the doctrine and tactics necessary to fight a conventional war. Meanwhile, the Union of Soviet Socialist Republics embarked upon a deliberate, massive conventional arms procurement and modernization program which has resulted in significant quantitative advantages.

Any qualitative advantages that have been enjoyed by the United States (or the Western North Atlantic Treaty Organization Alliance), and have been depended upon for such a long time as an equalizer to maintain parity, are also being rapidly offset by the Soviet's narrowing the gap in weapons technology. Shrinking technology gaps, fewer industrial bases for procurement and competition for increasingly scarce resources have combined to cause an ever more precarious predicament for United States defense planners.

The Soviets have not failed to notice the pioneering efforts of the United States Army in the field of airmobility and air assault. New technology married to new doctrine offers a significant potential advantage to those who seize it.[1] The helicopter's success and potential contributions to Soviet doctrine were discussed in a number of publica-

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1. Not all military strategists believe or agree the statement to be true. Colonel Donald F. Lunday, director at the U.S. Army War College Department of Military Strategy, Planning and Operations, recently pointed out in a newspaper article: "As a society, we (United States) tend to worship technology." The authors agree with Colonel Lunday's statement, and also believe that exaggerating the value of complex rotary air vehicles must be kept within the scope of their technical and tactical capabilities; however, one must remember that the use of the helicopter is still an area to be explored for many military applications. There is no doubt the Soviets are committed to the helicopter and excited by its potential. In a 1930 article in "The Cavalry Journal," then Colonel, later Lieutenant General George S. Patton Jr., articulated what he considered a cardinal principle of war: "So far as we know, few, if any, victories are traceable to weapons." (Source: "The Patriot," Harrisburg, PA, 25 March 1985, page A-8.) The following quotation from "On Eagles Wings" (New York: MacMillen Publishing Company, 1976, page 178) summarizes the concepts of General Patton, 45 years later:

"The human factor will decide the fate of war, all wars. Not the plane, not the screwdriver, or a wrench or radar or missiles or all the newest technology and electronic innovations. Men—and not just men of action, but men of thought. Men for whom the expression 'by ruses shall ye make war' is a philosophy of life, not just the object of lip service."

tions by Soviet authors during the past decades. Historically, the helicopter is relatively new to the art of warfare. Tapping the potential and the technology of rotary air vehicles has been an area of rapid growth in the tactics and doctrine of modern armies.

Beginning with medical evacuation contributions in Korea, plus some cargo and troop carrying experience, the helicopter became increasingly more important to the United States Army in the 1960s because of its advantages in added mobility and exploitation.

Although the United States is an acknowledged proponent of the theory of rotary wing assault aircraft employment, it was inevitable that others, including the Soviets, would also seize upon a now proven and highly successful concept. This is evidenced by the Soviets' 4,100 military helicopters in force and their annual rate of production: 800 helicopters in 1984.[2]

How survivable or how remarkable these new weapon systems will be in the future, or whether U.S. or Soviet helicopters will dominate the "diesel dinosaur tank" on the battlefield—as the potential armored giant killer—still remains for future history and historians to record.[3] Heavy investments in the development of helicopter forces by all modern armies reflect some very prudent hedging on old concepts and prejudices.

After riding in the U.S. Presidential helicopter, Kruschev was advised by his defense planners not to ride in a Soviet built helicopter

The Beginning. Soviet combat helicopters, until recently, were primarily lumped in with the rest of the old tactical Air Army's assets at the Front. The Soviet Air Force had its origins in the early 1900s, about the same time as those in most other Western nations. Known as the "Workers' and Peasants' Air Fleet" during the Russian Revolution, it was a "motley collection of aircraft flown by pilots recruited either by revolutionary fervor or the threat of death."[4]

Ever since the earliest days of the revolution, aviation research and development has been given a high priority within the Soviet Union. In spite of the revolution's effects, the Russians were among the early pioneers in air power. Some scientists, such as Igor Sikorsky, migrated to the United States. Others, like Mil, Tupelov, Sukhov, Mikoyan and Guryevitch, stayed. Some firsts were achieved, including the world's first multiengine aircraft, but in general, aircraft produced in Russia lagged in quality behind those of the West.

In 1918, the new Soviet regime created the Central Aero and Hydro Dynamic Institute. This institute, which plays a major role in today's Soviet aerospace industry, established its first helicopter design staff in 1925. The designers Mil, Kamov and others conducted experimental work on helicopters and their first autogiro flew in 1928; the first helicopter in 1932. However, the Russians did not consider these designs as having any practical uses.

Unfortunately, due to the complex mechanical nature of the helicopter and the required advance technology to produce them, the Soviets did not consider the helicopter again until the late 1940s (most other nations of the world also held this same attitude). Historically, Soviet helicopters have been a subject of "universal underestimation as a practical weapon."[5] Although fixed wing and rotary wing development began about the same time, the first successful helicopter was not produced until Igor Sikorsky built his VS-300 model in the United States in 1941. Until the late 1960s and early 1970s, the reputation of Soviet helicopter proponents improved little. In 1959, when Premier Nikita Krushchev returned to the Soviet Union after riding in a Presidential helicopter of the United States, he was advised by his Soviet defense planners that he "did not want to ride in a Soviet built one,"[6] Since then, two significant events have occurred to expedite the integration of the helicopter into the Soviet's combat forces:

2. U.S. Department of Defense, "Soviet Military Power 1984." Washington, DC: GPO, 1984, page 84.
3. M. Belov, "Helicopters Against Tanks," *Red Star,* 9 December 1970, page 2. M. Belov, the leading Soviet strategist on airmobile/air assault calls the tank a "diesel dinosaur." This intriguing comment is in almost direct conflict with Mr. David Williamson Jr., of the Center for Strategic and International Studies, U.S. Army War College, Carlisle, PA, who writes "the helicopter is at the end of its dinosaur line" (Source: "The Patriot," Harrisburg, PA, 25 March 1985, page A-8).
4. John Bradley, "The Russian War Machine." New York: Chartwell Books, Inc., 1977, page 154.
5. Asher Lee, "The Soviet Air Force." New York: The John Day Co., 1962, page 198.
6. David C. Isby, "Weapons and Tactics of the Soviet Army." London: Janis Publishing Company, LTD., 1981, page 317.

• *First*, the United States' development of the airmobile concept, the demonstration of its tactical value in Vietnam, and the continued refinement of airmobile/air assault operations by the United States Army.

• *Second*, technological advances which have reduced the vulnerability of the helicopter and increased its survivability and combat power.

Soviet helicopter advocates have capitalized on these developments and are rapidly integrating the firepower, mobility and survivability advantages of the rotary air vehicle concept into their strategy and doctrine.

Soviet commanders are discovering how combat helicopters can help them achieve their goals of conducting decisive deep striking, high-tempo operations over and around heavily defended terrain with a degree of flexibility previously unknown. The Soviets also have discovered the helicopter's versatility in *countering* similar activities in their own rear areas.

Given the U.S. concept of the nonlinear battlefield, Soviet heliborne and air assault forces are battle organized and equipped to take advantage of missions such as:

- Conduct of rear area operations designed to destroy high value targets such as command, control and communication facilities, and rear area logistics installations.
- Seize critical terrain emphasizing high-tempo objectives such as the capture of bridges and airfields (link-up planned, helo assets released).
- Seize and control terrain in the enemy's rear area to delay and/or destroy enemy reserve forces.
- Deception operations (feints, demonstrations and ruses).
- Pursuit of withdrawing enemy forces.
- Operational penetration along the coastline or bridge heads to ensure the landing of amphibious forces and the advance of friendly forces along or onto the coast.

Soviet student pilots returning after orientation in the Hind helicopter.

Caution. A major caution must be exercised when undertaking an assessment of the infrastructure of Soviet heliborne and air assault forces. Soviet ground force strategies, whether at the theatre, army or division tactical level of operations, always consider heliborne and air assault operations to be in general support of the offensive, and *are always a supplement to the* offensive strategy. Basic Soviet strategies are:

- Tanks are the main striking force.
- Artillery is the main means of fire.
- Ground forces' maneuver is the main means of offense.

Also, Soviet military "all arms" operational plans are *always* characterized by combined air and land operations (combined arms) to include air operations integrated into the overall plan waged through three aggregate military expressions:

- Land forces on 2 to 3 axes.
- An air operation.
- An air defense operation.

The Role of Soviet Military Aviation. Historically, the support of ground forces has been the most important policy of Soviet military aviation. During World War II, the Soviets achieved great success with the employment of forces that joined land and air forces. Today, aviation support is still an important aspect of Soviet military doctrine. Frontal aviation, the primary branch of Soviet Air Forces designed for participation in ground combined arms combat operations, is numerically the strongest arm of Soviet military aviation. Frontal aviation's methods of preparing for and conducting operations are focused on expediting the achievement of ground force strategic goals. To achieve these strategic goals, Frontal aviation units perform a variety of specified missions:[7]

- Aerial reconnaissance.
- Air cover.
- Battlefield and rear area interdiction.
- Electronic warfare missions.
- Direct close air support.
- Limited tactical transport.

Evolution of Soviet Military Aviation. Soviet military aviation forces are organized in three separate forces:[8]

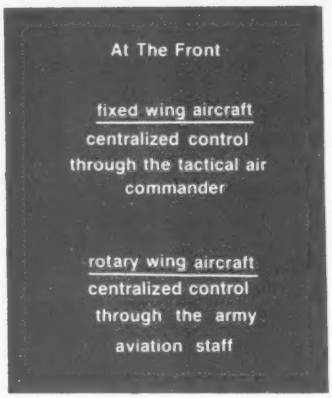
- Aviation of National Air Defense.
- Soviet Naval Aviation.
- Soviet Air Forces.

The specific branches of Soviet Air Forces include:[9]

- Long-Range Aviation.
- Military Transportation.
- Frontal Aviation.

Frontal aviation constitutes the bulk of the fixed wing Soviet Air Forces with about 6,150 aircraft.[10] The distribution of tactical fixed wing air assets within a theatre of military operations follows this accepted strategy:

- At the Front level, the tactical air commander serves as chief of aviation and exercises centralized control over fixed wing tactical aircraft.
- At the Front, army and division level, an army aviation staff is normally assigned to the commander and exercises centralized control over employment of heliborne forces.[11] This army aviation staff entity functions similarly to a U.S. Air Force air liaison section. The aviation staff group advises on the use of helicopter air assets, and coordinates the employment of army aviation assets within the various echelons of the Front.



The Soviet Helicopter Force

Soviet Army Aviation Helicopters. Combat helicopter forces are organized to conduct and support a wide variety of combat operations to include attack, airmobile and air assault operations. Attack helicopter operations are rapidly becoming an acknowledged Soviet specialty.

Again, relying heavily on history and their World War II success with the "IL-2 Shturmovik" (see "Tank Busters," by Mr. Edward J. Bavaro in the June 1985 issue of *Aviation Digest*, (page 4) and their observations of U.S. attack helicopter operations in Vietnam—the Soviets have, since 1974, integrated the attack helicopter (Mi-24 Hind) into their force structure.[12]

Soviet military authorities seem to agree that combat helicopters have, to some extent, freed fixed wing aircraft from the ground close air support role. Since 1976, heavily armed combat helicopters have been observed in every major Soviet military exercise such as Shchit-76 and Berezina in 1978.[13] This type of helicopter can attack tanks and other armored vehicles throughout the battlefield.

Also, attack helicopter operations can be used to lay mines, blow up bridges, create obstacles and to impede the movement of enemy ground forces. A recent Soviet innovation in the employment of Mi-24 armed helicopters is the air "ambush." The aerial ambush tactic is expressly aimed at the U.S. helicopter threat. For the Soviets, air-to-air helicopter combat is a viable counteroption to U.S. Army Aviation nap-of-the-earth tactics, and a means of gaining Soviet air superiority.

Heliborne operations (airmobile), are those distinguished as a temporary grouping of Frontal aviation lift assets allocated to a particular army or division in accordance with the overall Front plan. Specific missions are then accomplished using dismounted motorized rifle units. The force is landed intact without the usual scattering which occurs during an airborne operation. A combination of escort attack helicopters and direct support artillery and air cover will support the heliborne operation. These limited operations still can be organized and used by lower echelon commanders.

During Heliborne Offensive Operations

heliborne assaults are conducted within field artillery support ranges and must depend on link-up with advancing ground forces

A significant Soviet development is the employment of air assault units designed apparently for increased operational flexibility. Air assault units, which habitually train with helicopters, develop a far greater capacity for conducting complex missions. Techniques of employment are similar to those of heliborne operations but they are executed with a greater degree of deliberate planning.

Air assault forces are not constrained in the offensive to operate within range of supporting artillery fires. Their employment will include medium and heavy lift transport helicopters as a task-organized combat support organization. Or they may include the use of military fixed wing transports to assault or parachute-land brigade heavy equipment such as BMD (airborne assault gun) vehicles or air defense equipment.

Organization and Missions. Current Soviet literature has the helicopter forces organized into independent at-

7. U.S. Department of the Army, "Soviet Army Operations and Tactics," FM 100-2-1 (Draft). Washington, DC: GPO, August 1982, page 12-1.
8. Ibid., page 12-2.
9. Long-range Aviation and military transport Aviation are administered by the Air Force Commander in Chief, but are under the direct control of the Minister of Defense.
10. U.S. Department of Defense, "Soviet Military Power 1984." Washington, DC: GPO, 1984, page 57.
11. U.S. Department of the Army, "Soviet Army Operations and Tactics," page 12-11.
12. In World War II, the Soviet IL-2 Shturmovik was a remote forerunner of the Mi-24 Hind ground attack aircraft. Ignoring such aspects of air power as strategic bombing, the Soviets in their drive toward Berlin concentrated their aerial support to the close air battle in support of ground forces. When World War II ended, the Soviet Air Force had 100 ground air divisions and more than 10,000 IL-2 Shturmoviks. Simple, maintainable and with good crew armor protection, the Soviet IL-2 losses in the closing months of the war were estimated at 2,700 per month; deliveries were running 3,700 per month (Source: U.S. Air Force Historical Study #175, "The Russian Air Force in the Eyes of German Commanders," Air University Research Studies Institute, Washington, DC: GPO, June 1960, page 276; and Graham D. Vernon, "Soviet Combat Operations in World War II: Lessons for Today." *Military Review*, March 1980, page 31.
13. Ya. Samoylenko, "Tactical Airborne Assaults," *Voyennyy Vestnik*, No. 4, 1978, page 45; and U.S. Department of the Army, "Understanding Soviet Military Developments." Washington, DC: GPO, 1979, page 45.

The Mi-8 Hip gunship is an escort for air assault forces. The escort role for Soviet forces today is generally being conducted by Mi-24 Hind helicopters and eventually by Mi-28 Havoc helicopters.

tack helicopter regiments; independent transport regiments; and assault brigades for mission accomplishments.[14] Soviet theoriticians such as former chief of airborne troops, V. F. Margelov, and Soviet air assault strategist Major General M. Belov have argued that the chief advantage of a heliborne operation is simplicity.[15] Soldiers conducting such operations need only minimal training and support. The "minimum training" required for heliborne forces is a major operational attraction to Soviet offensive planners. The Soviets believe individual company training can be accomplished in as little time as 1 day with mockup fuselages. Typical missions would involve aviation heliborne regiments lifting second echelon motorized rifle troops to:

- Seize obstacles in advance of the main body.
- Capture bridgeheads, airfields or decisive terrain.
- Locate and engage enemy reserves.

Air assault troops offloading from an Mi-8 Hip helicopter.

With the continued large-scale production of military helicopters and the increasing acceptance of the helicopter by Soviet policy-makers, it was not surprising to see the Soviets take the next step in helicopter organizational refinement—the organization of air assault units.

Air assault operations are distinguished from heliborne (airmobile) tactics by the fact that air assault combat units habitually train with and are habitually supported by organic combat helicopters and fixed wing aircraft. These troops are referred in open writings as "Reydoviki" (derived English translation is "raid") forces. A typical air assault brigade normally commanded by a colonel would consist of a brigade headquarters, two BMD equipped battalions and two parachute qualified battalions. In addition to assault battalions and attached supporting helicopters, the air assault brigade is equipped with antitank guided missiles, aerial artillery rockets, guns, recoilless rifles, mortars, air defense weapons, engineers, light trucks and a headquarters unit. The missions assigned to the air assault brigades indicates a specialization in commando type operations. Examples of Soviet tactical raids include:

During Air Assault Offensive Operations

in the assault, attack helicopters assume the primary role of artillery

- Destruction of high value targets such as nuclear weapons and depot storage sites, command posts and signal facilities.
- Seizure of critical terrain emphasizing high-tempo objectives such as bridges and airfields.
- Seizing and holding favorable lines in order to delay or destroy enemy reserve forces.
- Deep thrust aerial and ground reconnaissance.
- Operational penetration along the coastline or bridgehead to ensure the landing of amphibious forces.

The very presence of Reydoviki forces would enable them to conduct deception operations such as feints, demonstrations and ruses.

Next month, "Part II: Employment."

14. U.S. Department of the Army, "Soviet Army Specialized Warfare and Rear Area Support," FM 100-2-2 (Draft). Washington, DC: GPO, August 1982, page 3-5.
15. General V. F. Margelov, "Bridge From the Clouds," Moscow, 1972, writes: "But perhaps the main distinction of the helicopter landing is that personnel who have been trained for just a few hours (8 to 10 hours of training time) can be used for it. Thus marines, combat engineers, mortarmen, and motorized riflemen, that is representatives of the various arms of troops, can readily be moved to the enemy rear using helicopters and begin active combat operations there."

GOAL - $2,500,000

NOVEMBER 1985 — $1,885,000 Cash and pledges

Army Aviation MUSEUM

This is a series about the Army Aviation Museum Foundation fund drive. Currently, plans call for building a modern complex to house your Army Aviation Museum. Since last month additional donations have been received. However, we still have a ways to go, as the barometer above shows. If you would like to help "build" the Army Aviation Museum's new home, you are invited to send a tax deductible contribution to: The Army Aviation Museum Foundation, Box 610, Ft. Rucker, AL 36362-5000. If you desire additional information call Mr. Ed Brown at (205) 598-2508.

A Look At What's In Your Museum

Built and delivered to the Army in 1968, this OH-6A served in the Vietnam War. However, in December 1971 it sustained enemy fire and subsequently crashed in U Minh Forest. After being rebuilt, this Cayuse was returned to service and used by the Silver Eagles, the U. S. Army's precision demonstration team. From 1972 until 1976 the OH-6A on display flew almost every performance in the right wing (number 2 position) of the Silver Eagles' flying demonstrations. In 1977, upon dissolution of the team, the OH-6A was transferred to the U. S. Army Aviation Museum.

OH-6A Cayuse

Systems Approach to Combat Training

The SAT methodology in getting maximum effectiveness out of training can save the Army vital time and resources, but it needs clear definition of battlefield tasks and equally precise ways of measuring performance.

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Colonel Andrew P. O'Meara Jr.
Lieutenant Colonel Raymond C. Hartjen Jr.

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The morning hours of 7 December 1941, found the U.S. Army understrength, equipped with outdated weaponry, soft from years of garrison duty, and totally unprepared for extended global conflict.

In June 1950, the Army was in exactly the same posture and equally unprepared to stem the North Korean advance to the south. The lessons of unpreparedness learned at a terrible cost in men and other resources only a decade before had been forgotten or buried in the apathy generated by a belief that the possibility of another major conflict was remote.

It has been more than a decade since the termination of the Army's involvement in Vietnam, but this time the

lessons of unpreparedness do not seem to have been forgotten. Major emphasis has been placed on maintaining an Army able and willing to defeat an enemy on a modern battlefield. Initiatives have not been limited to advanced weapon technology, physical fitness or new tactical doctrine.

One of the most important initiatives has been in the development of a methodology through which a systematic identification and investigation can be made of the tasks soldiers and units will be expected to perform in combat. This methodology is known as SAT, or the systems approach to training, and serves as the basis for the training requirements of the Army.

Success on the battlefield can only be achieved by skilled soldiers who are well-trained on modern equipment in cohesive, well-trained, well-led units. A situation in which modern equipment is placed in the hands of soldiers poorly trained in its use invites defeat in combat. Well-trained and well-equipped soldiers in units untrained in teamwork can be expected to fare little better.

The need for well-trained soldiers and well-trained units can be met through the stabilization of personnel in units and a thorough analysis of the task requirements expected to be placed on soldiers in combat. This task analysis serves as the basis for determining the skills that soldiers will need to learn in order to be successful on the field of battle.

The task analysis sequence is similar to the backward planning techniques that have served airborne and air-mobile forces so well. In order to prepare units and soldiers to perform effectively, these units have started their planning sequences with mission requirements after reaching the drop or landing zones and have worked backward through landing, loading and training requirements.

Training resources are always in short supply during peacetime. Money, materiel, personnel, time and facilities are limited and in great demand by all commanders.

The systems approach to training allows trainers and commanders to make the most efficient use of those scarce resources by identifying the skills and knowledge required by soldiers who are expected to win in battle and by eliminating training tasks that do not contribute directly to success on the battlefield.

For instance, a tank crewman whose personal weapon is a pistol has little need for training with an M16 rifle. Perhaps the time devoted to that rifle training could be better spent on additional crew gunnery training in the training base or in the unit.

When the systems approach to training was used in the development of the training program for M1 tank crewmen, nearly one-third of the "traditional" training given to soldiers undergoing one station unit training was discarded as being irrelevant to combat mission requirements, and many additional training needs were identified and included in the training program.

Members of an Infantry TOW missile team participate in an annual tactical training exercise that brought together Infantry, Artillery and Armor. Also, the U.S. Air Force provided close air support in conjunction with the latest Army Aviation weapon systems. This operation was an excellent example of cooperation among the combined arms.

As a result, soldiers who emerged from one station unit training were more prepared than their predecessors to meet the demands placed on them when they reached their units of assignment.

Units receiving these soldiers were able to devote more of their training time to unit training tasks because the new soldiers required less additional individual skill training. Unit mission proficiency could therefore be expected to increase.

The development of a training program using SAT requires that two basic questions be answered:

• What tasks do commanders want the soldier to perform in combat?

ABOVE: A jeep-mounted 106 mm recoilless rifle rolls off a CH-47 Chinook during the regimental airlift. Transporting nearly 2,000 soldiers and artillery in a cross-FLOT operation, that day the combined Aviation force carriedout its largest air assault of Team Spirit 84.

LEFT: An 11th Aviation Group pathfinder maintains radio contact with a CH-47 as it lands in the Malsheim PZ as the opening phase of "Albatross IV," NATO's annual air assault maneuver begins.

Systems Approach, *continued*

• What does the soldier need to know in order to perform those tasks?

The tasks identified for soldiers to perform in combat are determined from a thorough analysis of organizational missions normally assigned to units to which soldiers in a particular military occupational specialty (MOS) are assigned. This requires a clear visualization of future battlefield requirements. In the analysis of an infantry mission, for example, the identification of a need for a soldier to be effective or courageous does little to define any particular task that soldiers would be expected to perform.

The identification of the specific need for an infantryman to be able to use his rifle to kill an enemy soldier comes much closer to meeting the task identification requirement. Task identification must always be the result of an analysis of battlefield mission requirements.

Understanding the battlefield is essential, if an accurate mission task analysis is to be made. Over the years, professional soldiers have used many techniques to facilitate understanding of the battlefield. Before World War II, the German Army developed large sand tables and used individual toy soldiers for the conduct of maneuvers and the training of the chain of command in the execution of their responsibilities.

Today, the U.S. Army uses several techniques to facilitate understanding of the modern battlefield, including analysis and publication of threat doctrine, map maneuvers, computer-assisted wargaming and field train-

ing exercises conducted against realistic opponents employing threat doctrine at the National Training Center, Ft. Irwin, CA.

These endeavors assist in the development of Army leaders' abilities to visualize unit mission requirements on battlefields of the future and contribute significantly to the accurate identification of those tasks that soldiers will be required to perform in combat.

For each task identified, trainers and leaders must determine what the soldier needs to know or be able to do in order to perform the task.

Using a rifle to kill an enemy soldier requires that an infantryman be able to load his rifle, acquire a target, sight his weapon properly, manipulate the trigger properly and clear potential weapon stoppages, among other things. Each of these skills must be taught or reinforced if the soldier already possessed the skill or knowledge before entering the Army. Skill and knowledge requirements determine that which must be taught.

Once trainers and leaders determine what soldiers need to know and do in order to be effective on the battlefield, an evaluation must be made of the current training program to determine: if those required skills and the pertinent information are being taught; if that which is being taught is adequate to meet requirements; and, if unnecessary subjects are being taught.

A new, more effective training program can then be devised based on identified needs rather than on intuition, guesses and the tradition of past training.

Because the SAT requires an analysis of missions to determine the basic skills and knowledge required of soldiers, it seemed logical to begin the integration of SAT methodology into the Army training system at the initial entry training level. Until trainers and leaders determined exactly what they wanted soldiers to do, it appeared unlikely that they could determine exactly what they wanted the leaders to do on the battlefield.

Since the supervisory duties of the leaders are contingent on the duties of soldiers they lead, the integration of SAT into the service school system needs to progress from the lower enlisted skill levels through the higher levels and on through the officer training system so that military education will continue to be based on need and not on conjecture.

In the military, the bases for organization power and effective leadership are:

• *Legitimate power.* This is power generated by the organization and vested in individuals by virtue of the individual's rank in the organization. Sergeants, therefore, have power over privates and lieutenants have power over sergeants. Rewards and punishments are based on the legitimate powers of soldiers rather than on their size or any other factor. The willing compliance of subordinates to the demands of seniors is not a requirement in the use of legitimate power.

• *Referent power.* This refers to the power that the leader derives from being the role model for his subordinates. The amount of this power is directly proportional to the degree to which subordinates identify with the leader. Subordinates who closely identify with a leader see him first as a personal role model and then as the embodiment of the noncommissioned officer or officer corps, the unit and the Army. Subordinates follow this leader because they respect his judgment and ability to interact with others.

• *Expert power.* This power over others is the result of knowing more about a given subject than anyone else in a group. If only one member of a group were a lawyer, any other member of a group who had a problem with the law would probably seek and heed his advice. In the military, if the leader expects to be effective, he must be an expert in his specialty or his subordinates will look to others for advice when problems arise.

Effective leadership requires the use of these powers, and the most effective leaders tend to use referent and expert powers most because they realize that willing soldiers generally perform better than unwilling ones. Legitimate power is often best used to reinforce the others.

The systems approach to training is effective in increasing the expert power necessary for effective leadership by concentrating training efforts on the skills and knowledge that the leader truly needs to perform his duties effectively.

For example, a tank commander who is unfamiliar with the duties of the crew in engaging a target or who does not know the duties of each crewman in the performance of preventive maintenance checks and services will discover that he is a tank commander in name only. Someone else will assume informal leadership of the tank crew.

For this reason, leader training must ensure that leaders know the duties of their subordinates in order that they may supervise them effectively. Supervisory tasks taught in the officer and noncommissioned officer education system must be based on an accurate analysis of the tasks performed by those soldiers being supervised. A leader

The AH-64 is the Army's newest and most modern attack helicopter. It is used to attack enemy armor in day, night and adverse weather conditions in conjunction with other maneuver and combat arms.

Systems Approach, *continued*

training program that is not based on this principle cannot provide the expertise that leaders need to be effective.

SAT identifies training needs for initial entry training soldiers; it can also identify and verify training needs for leaders.

In addition to initial entry and leader training, SAT can be beneficial in the improvement of specialized training programs. Courses in supply procedures, motor pool administration, personnel procedures and many others can be more effective if course designers ask what the students in these courses will need to be able to do upon graduation and what they need to know in order to do it.

Airborne training may be a good example of a course for which SAT could play a key role in a training program revision.

What is the graduate of this course expected to do upon graduation? Simplistically, the soldier will be expected to jump with combat equipment from an aircraft, reduce any parachute malfunctions, land safely, join his unit and engage the enemy in combat. In order to do this, he must become skilled at loading and exiting the aircraft correctly, identifying and reducing parachute malfunctions, assuming the proper landing position, landing and releasing his parachute harness. There are, of course, a number of other skills and bits of information he needs to acquire.

The next question to be answered pertains to an analysis of the existing training plan and its comparison to that training necessary to meet the training need.

Joining his unit on the drop zone and engaging the enemy are skills not now learned in airborne training. Airborne training does, however, teach the rest of the necessary skills.

Is the time devoted to training consistent with that which is necessary to acquire the skill? Airborne training is now 19 days in duration.

In Vietnam in 1967, a shortage of qualified airborne replacements in the 1st Brigade, 101st Airborne Division, led to the establishment of an airborne training course in the brigade base camp that produced qualified paratroopers in just 5 days. General officers and selected staff officers undergo an abbreviated airborne training course that lasts less than 3 days. Civilian parachute schools qualify parachutists in a weekend.

Why does the discrepancy between training times exist? Physical conditioning should not be a factor, since airborne candidates must pass a physical training test to get into the school, and no special physical skills must be necessary in order to successfully parachute if generals, selected staff officers and civilians do not also need them. All parachutists are volunteers, so motivation must not be an issue. Morale and esprit are not skills and are developed in the unit.

Perhaps SAT can provide the answer. It certainly provides a systematic structure for asking important questions.

Linked closely with SAT is the concept of standardization: uniformity both in the method for determining training requirements in a specific MOS through all skill levels and in the application of task proficiency measurement standards in the training base and in deployed units.

SAT is the appropriate instrument for achieving standardization in a given MOS through all skill levels. All military occupational specialty and skill-level training programs must use SAT if standardization in training is to be achieved.

The other facet of standardization is found in the uniform application of task proficiency standards, in both the training base and in units deployed around the world.

The uniform application of task proficiency measurements also includes an analysis of each standard to determine its validity. Take, for instance, the measurement for crew qualification on the tank crew qualification course.

Is it realistic to allow a tank crew that fails to hit the first main gun target to proceed through the course and still qualify satisfactorily? The tank crew that misses its first tank target in combat has a high probability of being destroyed in return. A more realistic measurement criteria for tank crew qualification might be to issue a given number of main gun rounds to a crew, require that the crew fire at each main gun target until it is hit before moving on to the next target and count as qualified those tank crews that run out of targets before they run out of ammunition.

Airborne qualification is another example of a standard that could be questioned. How or why did five jumps become the measurement for qualification? Could a parachutist be considered qualified after only one jump or should qualification occur after one practice jump and one equipment jump? Does a parachutist need to experience a night jump before he is considered fully qualified?

Other standards could bear investigation as well. Is proficiency at a specific event on a physical training test required in order to be successful in combat? How does that particular exercise contribute to mission success?

If the need for proficiency in the event cannot be documented for everyone taking the test, perhaps the event should not be used as a proficiency standard. The time standards of weapons assembly and disassembly used as measurements of proficiency in the training base often have little application in field units. If standards are not useful in units, then they should not be used in training.

Earlier, soldier stabilization was identified as being one of the requirements for unit proficiency, yet in spite of efforts such as the new manning system and COHORT (cohesion, operational readiness and training) units, soldier turbulence still exists in units and probably will for some time to come.

If stabilization in training and the uniform application of proficiency standards can be achieved, much headway will be made toward lessening the impact of soldier turbulence in units.

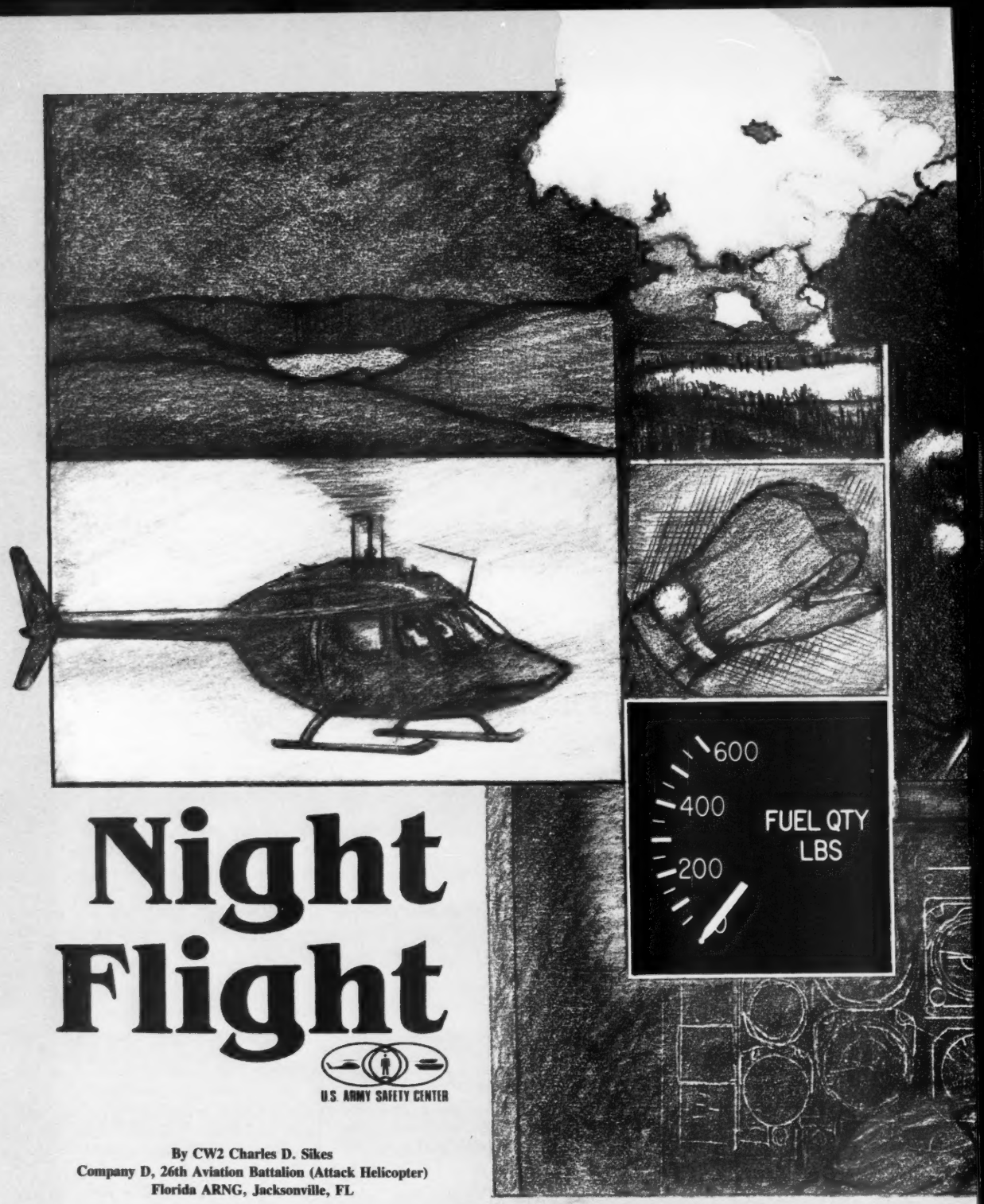
Standardization of training is essential to a combat-ready Army, so that soldiers who learn drills and crew duties in one unit can then expect to perform the same duties and actions to the same standards in any other similar unit. "Train-up" time for new soldiers in units can then be reduced or eliminated. That is the essence of the standardization concept.

The systems approach to training and standardization appears to be absolutely necessary if trainers and leaders are to reduce the shortfall between the capabilities of the Army's combat equipment and the capabilities of its soldiers and leaders to use that equipment successfully on the battlefields of the future.

Soldier and leader training must be concentrated on the acquisition of necessary skills and not diluted by unnecessary or counterproductive training.

Standardization in the methodology for determining training requirements and in the application of proficiency measurements are closely related. Their use in training today ensures success in combat tomorrow.

Editor's Note: Army Aviation actions to develop standardization in methodology to determine training requirements are discussed in this month's "DES Report to the Field" on page 30.



Night Flight

U.S. ARMY SAFETY CENTER

By CW2 Charles D. Sikes
Company D, 26th Aviation Battalion (Attack Helicopter)
Florida ARNG, Jacksonville, FL

INSIDE the OH-58, Jim brought the power back up for takeoff. He glanced at his watch, at the fuel gauge, and back at his watch. A quick look at the sky told him the weather was getting worse, robbing the winter day of the little light that remained. He had flown in worse weather than this though, and he wasn't worried about doing it again. Still, he mused, if he had his "druthers" he'd be relaxing before a crackling fire about now.

With ease, the helicopter rose to a hover and rotated about its axis. The nose lowered slightly and, with a slight shudder, the helicopter accelerated forward and upward. After he had established his airspeed and altitude, Jim banked the aircraft smoothly to the right. He headed north, intending to follow a small valley back to the landing zone and the tent that had been his home away from home during the field exercise.

As the minutes passed, he thought about the long, hard hours he had spent in the cockpit during the past few weeks. With a grin, he thought of the hot bath and cold wine he was going to enjoy the next day back in his own apartment. The thought of a flushing toilet even seemed luxurious at this point.

Ahead of the aircraft he saw a curtain of white. He only had time to think, "Snow," before the helicopter was engulfed in the heavy downfall. As the snowflakes rushed at the windshield, they created an illusion of flying through a white tunnel. He looked at the air temperature gauge. Four degrees centigrade; icing shouldn't be a problem.

With the decreasing daylight and falling snow, visual navigation clues became difficult to find. Between his time en route and what terrain he could positively identify, he estimated he was about 2 miles away from destination. He reached down with his left hand and adjusted his radio selector switch to transmit.

"Thunder-horse five five, this is Thunder-dog four two. Over."

"Roger, Thunder-dog four two, this is

Thunder-horse five five. Over," the radio crackled.

"Thunder-dog four two is Delta. I'll call skids down homeplate. Over." He rounded a bend in the valley and was on the home stretch.

"Roger, four two; supper's waiting."

The hilltops were now completely obscured by clouds. He slowed his airspeed and lowered his altitude. Darkness and snow encircled the helicopter, reducing visibility to less than 100 yards.

"Thunder-horse five five, this is Thunder-dog four five. Skids down homeplate."

Jim smiled as he heard the transmission. Scott had made it back safely. Now he could use Scott's navigation lights for reference in finding homeplate himself.

In an effort to be as tactical as possible, someone had decided to locate the platoon landing zone in a small field near the top of a hill. The hill was now wrapped in a blanket of clouds and darkness. That, combined with the fact that his OH-58 was not designed for flying through clouds on instruments, justified his growing uneasiness.

He now found himself hovering only a few feet above the trees, searching for the base of his hill. When he finally located it, he felt his apprehension increasing. He paused to weigh his options before beginning the ascent. He could try to find somewhere else to land and risk being lost in the snowstorm, or he could fly up the side of the hill and risk not finding Scott or the field. It seemed logical that if he had trouble finding the landing zone he could ask Scott to turn all his lights to full bright. Pride crept into Jim's decision. If Scott could do it, so could he. He began flying up the hill through the swirling snow.

Halfway up the hill, the shroud of darkness and snow became complete. The only thing left visible to Jim were the pulsating, snow-covered branches beneath the skids. Snow accumulated on the windshield. The Kiowa had no windshield wipers; it wasn't built to fly in this kind of weather.

Now his fuel was getting low. He figured that, without ground references, he had about a 50-percent chance of getting the helicopter down safely. But he wasn't ready to give up yet.

To hell with it, he thought. He punched the transmit switch.

"Thunder-dog four five. Scott, turn your lights on, dammit; I'm lost."

"I'm lit up like a Christmas tree, Jim; where the hell are you?"

Jim's eyes searched in vain for any sign of light. "Somewhere on the side of this godforsaken hill."

His shoulders slumped. For a moment everything seemed silent. He didn't even hear the noise of the rotor blades furiously slashing through the air. He looked out at the moving branches beneath him.

"Okay, Scott, I'm gonna come back down the side of the hill and try to find you." He looked out into the darkness. "Leave your lights on, buddy."

"I'll be right here waiting for you."

Jim could hear the worry in Scott's voice.

He turned the helicopter parallel to the contour of the hill. Thinking that the landing light might help him see better, he turned it on. That was a bad decision. Everything outside the aircraft became a glaring white. The light reflected from the snow was blinding, and he turned it off. Red spots floated before his eyes. Fear caused bile to rise in the back of his throat. He swallowed hard as he searched for the treetops. A blur of white rushed beneath the skids, and he caught a glint of light from the corner of his eye. He peered out his door window, trying to find it again. A huge tree, taller than the rest, seemed to rush at the helicopter. Jim reacted, pulling in power and banking. The skids just missed the top of the tree.

Suddenly there were no more trees. There was no ground. There was nothing but darkness and snow.

Jim's eyes strained, looking for the ground or anything he could use as a reference. For a moment he thought he saw an anticollision light farther down the hill. Maybe, he thought, it's Scott, but the mystery light had disappeared. Precious seconds ticked by. Reality forced itself upon him. He was committed; he had to try to fly the helicopter on instruments.

Jim focused his eyes inside the cockpit. His attention locked on the attitude indicator, the only thing that could tell him which way was up and down. The indicator showed that he was in a left bank although his senses told him he was perfectly level. Jim knew the instruments were right and that his inner ear was playing deadly tricks on him. He fought back his rising panic. Everything seemed unreal, as if he were watching something happening on a TV screen. The only sound he heard was his own blood roaring in his ears.

Jim focused again on the attitude indicator and tried to block everything else out. He forced himself to concentrate on flying the helicopter.

Attitude, heading, power, airspeed, and recovery. These were the relatively simple steps he had been taught for flying in the clouds. That's what he had to do now.

He leveled the aircraft and pulled in power, putting the helicopter into a climb on a heading of two four zero degrees. His last position was a safe distance from the East German border, so the possibility of straying into their airspace and getting shot down seemed remote. Almost all of West Germany was covered by radar, so he knew that once he climbed past 2,000 feet, air traffic control could pick him up and, he hoped, direct him out of the clouds.

Jim's heartbeat settled down a little, and his vertigo diminished to mild disorientation. Fear still pressed in upon him, but he was alive. The first few seconds in the clouds were what killed most aviators, but he had survived them.

He knew he wasn't in the clear yet. He had to get on the radio and try to find a way out of the clouds. As he reached over to transmit on the UHF emergency frequency he thought about his father. If he didn't get out of this

mess, if he crashed, his dad, an ex-pilot and retired officer, might hear the tapes of this last flight. He couldn't bear the thought of his father thinking he had panicked. With a deep breath, he punched the transmit button and said, in the calmest voice he could muster, "Mayday, Mayday, Mayday. Army 20761 is inadvertent IMC." He released the mike.

There was no response. Only silence. His airspeed was 60 knots, and the vertical speed indicator showed the aircraft was climbing at 700 feet per minute. He passed through 2,200 feet and decided to level off at 4,500 feet.

Struggling to stay calm, Jim again transmitted. "Mayday, Mayday, Mayday. Army 20761 is inadvertent IMC, requesting assistance. Over."

"Roger, 761, this is Frankfurt Radar. Over."

Jim's heart leaped. He transmitted again. "Frankfurt, this is 761. I'm a U.S. Army OH-58 approximately 10 nautical miles northwest of Fulda, climbing through 2,700 feet for 4,500. Over."

He remembered he needed to set the transponder so the radar could identify him. In his initial confusion, he had forgotten to set it on emergency. He turned his head to adjust it. When he looked back at the attitude indicator, he was hit with a sudden wave of vertigo.

The roar inside his head increased. Tunnel vision returned. The world seemed upside down as he fought for control. His body was wet with sweat, but his mouth was dry. Slowly, through total concentration for what seemed like an eternity, his sense of balance returned. A voice, calm and controlled, was speaking to him. He realized it was Frankfurt.

"761, do your read me? Over."

"Yeah." He wiped sweat from his brow. "Yeah, Frankfurt, I got you."

"Roger, 761. I have radar contact with you. Please state amount of fuel on board and intentions."

Jim hadn't checked his fuel for a while. When he did, it merely added to his tension.

"Frankfurt, this is 761. I have less than thirty minutes of fuel on board. Request immediate vectors to VFR." He leveled off. "Or any open airfields within 60 nautical miles. I'm level at 4,500 feet."

"761, request you change frequency to VHF 139.75 and squawk 0015 on your transponder. I'll have your information momentarily."

"Frankfurt, I can't do either. I'm a single pilot, and I'm having problems with vertigo. This whole thing has got to be a GCA."

"Roger, 761. Stand by."

"Roger, Frankfurt, this is 761." He waited for good news.

After a short pause, the voice returned: "761, Fulda, Fritzlar, Hanau, and Frankfurt are your nearest airfields. All, however, are reporting below minimums for instrument approaches."

Great, Jim thought, just great. His father had told him long ago that it was better to be on the ground wishing you were in the air than in the air wishing you were on the ground. The truth of that statement was now all too apparent. He pressed the transmit switch. "Frankfurt, who's showing the highest ceiling?"

"761, Hanau is reporting 150 feet. That's the best you can get. Half of Europe is socked in from the front that's passing through this evening. Over."

Jim looked at his fuel. There was no time to be indecisive. "Frankfurt, give me vectors to Hanau. I'll be requesting a GCA—and be advised, I'm running out of fuel."

"Roger, 761. Descend to 3,000 and turn left to two zero zero degrees; vectors to runway 26 PAR at Hanau. Over."

A red light suddenly illuminated the cockpit. Jim's heart leapt; he could almost feel it in his throat. He scanned his caution lights, but he knew the answer before his mind could form the question. Anger rose up within him. The low fuel light flashed at him, almost taunting him.

"Frankfurt, I have a steady low fuel light. Let's not dilly dally."

"Roger, 761. Descend further to 2,000 feet and come right to two three zero degrees."

Jim heard the voice, but the message didn't register. His engine rpm had suddenly dropped. The rotor noise changed, and the altimeter showed a rapid descent. The engine had quit.

"Mayday, Mayday, Frankfurt, this is 761. I have an engine failure at this time. Over."

The controller's response was quick but useless. Jim thought the man sounded even more scared than he was. The time had passed for fear. A strange calm settled over Jim. So much for the 20-minute fuel light, he mused.

Jim maneuvered the aircraft into autorotation. Three things could kill in a crash: high airspeed, high rate of descent, and unusual attitude. If he could control two of them, he reasoned, he should be able to survive.

He reached up and closed off the fuel control handle and shut down all unnecessary systems. His airspeed was 60 knots; all he could do now was wait.

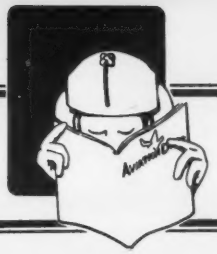
Search and rescue was launched early the next day. Scott was the first to find the crash site. As Jim's friend and fellow officer, he accompanied the body home.

About the Author

CW2 Charles D. Sikes entered the United States Army in December 1976. He served 1½ years in Special Forces before attending flight school. In June 1980, he was assigned to Air Troop, 11th ACR, in Germany where he was a tri-border pilot flying cavalry missions for 3 years. In July 1983, CW2 Sikes was assigned to Fort Carson, CO, as a scout weapons team leader for D Troop, 110th Cavalry.

CW2 Sikes left active military service in June 1984 and is currently assigned to Company D, 26th Aviation Battalion (Attack Helicopter), Florida ARNG, Jacksonville, FL. A full-time student at Florida State University in Tallahassee, CW2 Sikes is majoring in English. He wrote this article as a course requirement. It is based on an incident he experienced while serving in Europe.

VIEWS FROM READERS



Editor:

I certainly enjoyed Edward Bavaro's June 1985 article "Tank Busters." It provided a nice, concise overview of the historical use of aerial assets to combat the tank, but fell short of answering the introductory question, "But are tanks really the best means of fighting tanks?" Presumably, one was supposed to arrive at the conclusion that aerial assets, especially the helicopter, are *really* the best means of combating the tank. Since the article did not even examine the tank vs. tank scenario, *any* answer to the introductory question must be based on data not supplied by Mr. Bavaro. Therefore, the question was inappropriate to the article.

Two other things disturbed me about "Tank Busters." Both, I believe, are indicative of Americans' inability to understand Soviet military thought as the Soviets understand it. At issue is the quotation of Soviet Major General Belov, "Just as tanks have always been the most effective weapon against tanks, so helicopters are the most effective means of fighting helicopters." To understand this statement as a Soviet would, one must think of both tanks and helicopters from a Soviet perspective.

Key to this understanding is the famous quotation of Lieutenant General V. G. Reznichenko in his book, *Tactics*. "The offensive is the basic form of combat action. Only by a resolute offensive conducted at a high tempo and to great depth is total destruction of the enemy attained." In land warfare, the tank is the best vehicle suited to attaining this end, combining movement, firepower and armor to seize and hold terrain. Given the supporting assets a Soviet tank regiment drags around behind itself, let alone a tank division or tank army, it can attack and defend itself as can no other unit.

To the Soviets, the helicopter is more than just an aerial asset to supplement the tank, it *is* a tank. As Mr. Bavaro pointed out, the *Hind* combines movement, firepower *and armor*; what he missed, however, is its mission is to seize and hold terrain. But, unlike the tank, the *Hind* cannot drag its logistics tail behind it across the battlefield; instead, it must return to it at the end of each mission. Thus, in terms of the basic form of combat action—the offensive—the tank is superior to the helicopter in real staying power *except when* attack helicopters are employed in concert with combined arms forces against an enemy with inferior conventional capabilities, as in Afghanistan.

While the Soviets are cognizant of the favorable exchange ratios for helicopters in helicopters vs. tanks exercises and tests, this has not altered the central role they have assigned the tank on the conventional battlefield. It has, however, altered the combined arms mix and contributed to the restructuring of their air defense organizations. No *real* test of the helicopter vs. tank scenario has been conducted—on the battlefield, combined arms army against combined arms army. Until that occurs—and the helicopter wins—I doubt that General Belov will accept Mr. Bavaro's gambit and "qualify his often quoted pronouncement."

Jack B. Keller Jr.
DAC, GS-132-12
Foreign Science Information Officer

Editor:

I thoroughly enjoyed the article "What Do You Mean, I'm Not in the Aviation Branch?" (December 1984 issue) by CW4 Mark Wrinn. His expressed views are shared by all warrant officer aviators; but, after 16 years in the Army, he still has not learned the reasoning behind the Army's decision to exclude warrant officers from the Aviation Branch. It's simple, the Army did not use logic when making this decision.

It is the same thing with the new green summer uniforms issued 3 years ago. This uniform restricts a soldier from wearing any badges. Here a soldier works very hard to finish jump school, flight school, etc., and his only recognition comes in the form of a badge, proudly displayed on his chest. So what does the Army do? It comes out with a uniform that restricts one from wearing any badges. And this comes at a time when many units suffer from a certain cohesiveness, and this cohesiveness is called pride. Restricting soldiers from wearing their badges is like telling them to leave their pride in their footlockers. Why not let them show off a little bit? Give them some reason to be proud to be in the Army.

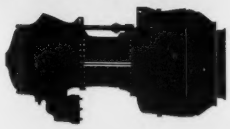
CWO John Taylor
DEARNG

An article is being assembled for a future issue of the ***Aviation Digest*** *on an operation called LAMSON 719, which took place in Vietnam in February and March 1971.*

Request anyone who participated in that operation and who may have any photographs, maps or related memorabilia contact one of the following at Ft. Rucker, AL: CPT Jim Fulbrook, USAARL, AUTOVON 558-6847; CPT Dave Wabeke, DCAT, AUTOVON 558-2543; or CPT Mike Moody, DCAT, AUTOVON 558-4951.

Our apologies to Captain Robert W. Weien, M.D., coauthor of "Dehydration, Heat Illness and Army Aviation." In the July issue his name was misspelled and his assignment should have read: Army Aeromedical Activity, Ft. Rucker, AL. The article was a student project in the Army Flight Surgeons Course.

CH-47 TEAC Revisited: To Enter and How



CW4 Ruffin C. Moore
U.S. Army Aviation Logistics School
Fort Eustis, VA

THE MAY 1985 edition of *Aviation Digest* contained an article on when and how to accomplish turbine engine analysis checks (TEACs) (TEAC means guaranteed engine performance). It also made reference to several problems identified by the Directorate of Evaluation and Standardization, U. S. Army Aviation Logistics School (DOES, USAALS), Ft. Eustis, VA, during visits to field units.

During recent visits to the field, the maintenance test flight evaluators from the DOES have found considerable confusion regarding required T55 TEAC entries on the overprinted Department of the Army (DA) Form 2408-15. The same problems have been found when entering data for the T53 and T700 series engines also, in spite of the fact that detailed block-by-block instructions are provided in DA Pamphlet (PAM) 738-751. Maintenance test pilots and technical inspectors should continue referring to this publication for proper procedures when filling out their DA Form 2408-15.

The T55 engine entry instructions were dropped from the old Technical Manual 38-750 several years ago and have not been picked up in DA PAM 738-751. The usual result is very critical engine historical data being entered erroneously or, in extreme cases, not being entered at all.

Most of the confusion with the T55 engine stems from the differences in the entries required for a baseline TEAC and the normal TEAC. Entries to the N_1 percent ACT REQ* and EGT/TOT (exhaust gas temperature/turbine outlet temperature) ACT REQ blocks are the two predominant problem areas on the form. For a baseline TEAC, the inflight recorded N_1 and EGT/PTIT (power turbine inlet temperature) (L-7 and L-11 series) have to be corrected to standard day prior to entry. No entry is made until the engine has been properly TEACed. The corrected data now becomes the baseline N_1 and EGT/PTIT and is entered in the ACT column for their appropriate blocks. The engine run sheet/data plate information is then entered in the REQ columns for comparison.

A normal TEAC requires the baseline N_1 and EGT/PTIT to be adjusted to the ambient conditions for the altitude at which the engine is TEACed. The adjusted data is entered in the REQ columns for the appropriate blocks and the inflight readings are entered in the ACT columns for comparison.

A second area of concern is the requirement to predetermine target N_1 for the L-7 series engine. This determines the N_1 overspeed limit that should not be exceeded. This limit will vary with temperature. Predetermination of N_1 targets is not required for the L-11 and L-712 series engines since they have fixed overspeed limitations (103 percent and 107 percent, respectively). The predetermined N_1 target is frequently interpreted as being the required N_1 and is erroneously entered in the REQ column of the N_1 block. Since it is only a temporary limitation, the target N_1 value should no longer be used once the TEAC is completed.

Fielding of the L-712 engines has added to the confusion of completing DA Form 2408-15 because the TEAC data is analyzed differently than for the L-11. First, the TEAC consists of two separate checks, the engine topping and the power assurance check (PAC). The engine topping is performed whenever an engine, fuel control or free air temperature gauge is changed or whenever maximum performance is suspect. The function of the topping is to determine if military/maximum trim is properly adjusted. Analysis of the engine topping check consists of an N_1 and/or a PTIT range that the engine readings must fall within.

The PAC is performed to confirm the engine's power/measured gas temperature relationship and is done after every phase (NO. 15/30 progressive phase maintenance (PPM) for D models) or any time it is desired to verify engine performance (i. e., after a high health indicator test (HIT) check). In other words, the PAC has replaced the normal TEAC for the L-712 engine. The PAC PTIT must fall below a determined value.

In either case, required N_1 and/or PTIT are determined. Required torque is not needed nor can it be determined; therefore, depending on the check, the torque ACT REQ block may or may

*N_1 percent (gas producer speed measured in percent) ACT REQ (actual required).

TURBINE ENGINE ANALYSIS CHECK DATA

1. MODEL: T55-L-11D | 2. SERIAL NUMBER: LE 19123 | 3. PAGE NO.: 1 | 4. NO. OF PAGES: 1

5a DATE	5b ACFT SER NO	5c ENG TSO	5d OAT	5e PRESS ALT	5f N1% ACT	5f N1% REQ	5g TORQUE ACT	5g TORQUE REQ	5h EGT/TOT ACT	5h EGT/TOT REQ	5i REMARKS
2 AUG 84					98.7				817		ENG RUN SHEET N_1 - 100.3
2 AUG 84	70-17107	0	+20°C	2000	99.0	98.7	90	87	825		Baseline for install PTIT- 830
12 DEC 84	70-17107	87	-10°C	4000	97.8	98.0	95	97.5	810	800	Normal TEAC for high HIT

DA Form 2408-15, 1 JAN 84 (TM 38-750) HISTORICAL RECORD FOR AIRCRAFT

FIGURE 1: DA Form 2408-15 for T55-L-11.

TURBINE ENGINE ANALYSIS CHECK DATA

1. MODEL: T55-L-712 | 2. SERIAL NUMBER: LE-19372K | 3. PAGE NO.: 1 | 4. NO. OF PAGES: 1

5a DATE	5b ACFT SER NO	5c ENG TSO	5d OAT	5e PRESS ALT	5f N1% ACT	5f N1% REQ	5g TORQUE ACT	5g TORQUE REQ	5h EGT/TOT ACT	5h EGT/TOT REQ	5i REMARKS
27 OCT 84	83-23385	0	+10°C	2000	104.2	104.5			870	885	Baseline for install
23 JUL 85	83-23385	153	+20°C	2000			46		610°C	645°C	PAC for No. 15 PPM

DA Form 2408-15, 1 JAN 84 (TM 38-750) HISTORICAL RECORD FOR AIRCRAFT

FIGURE 2: DA Form 2408-15 for T55-L-712.

How to fill out a DA Form 2408-15 (Overprint for Turbine Engine Analysis Checks (TEACs)) (T55-L-7/L-11 series) Completion Instructions By Block Number and Title.

1. MODEL. **Enter the engine type, model and series.**
2. SERIAL NUMBER. **Enter the engine serial number.**
3. PAGE NO. **Enter the page number.**
4. NO. OF PAGES. **Enter the total number of pages. You can use a black lead pencil for this entry.**
5a. DATE. **Enter the calendar day, month and the last two digits of the year that the entry was made or the test was completed.**
5b. ACFT SER NO. **Enter the complete aircraft serial number.**
5c. ENG TSO. **Enter the cumulative time since new or last overhaul on the engine.**
5d. OAT. **Enter the actual outside air temperature (OAT).**
5e. PRESS ALT. **Enter the altimeter reading with barometric pressure indicator set at 29.92 inches Hg.**
5f. N_1 PERCENT ACT REQ.
(1) ACT.
(a) Initial entry will be the maximum N_1 off the engine run sheet data plate.
(b) BASELINE TEAC. Enter the N_1 recorded in-flight corrected for temperature. This becomes the baseline TEAC.
(c) NORMAL TEAC. Enter N_1 recorded in-flight.
(2) REQ.
(a) Initial Entry. No entry.
(b) BASELINE TEAC. Enter the maximum N_1 from green run sheet or data plate.

not have an entry. (See examples 3 and 4 below.)

The following examples, with block-by-block instructions, are provided to assist field users in making the proper DA Form 2408-15 entries. They have been written in the same format as DA PAM 738-751 to eliminate confusion.

Example 1: T55-L-11D serial number LE 19123 was installed on aircraft 70-17107 and the test flight was completed 2 Aug 1984. Engine run sheet data: N_1 98.7 percent, PTIT 817 degrees centigrade. The engine was topped at a pressure altitude (PA) of 2,000 feet and outside air temperature (OAT) of plus 20 degrees centigrade. Aircraft 17107 has fiberglass rotor blades (FRBs) installed. The engine TEAC data was N_1 100.3 percent, torque 90 percent, PTIT 830 degrees centigrade. Since this is a baseline TEAC, the inflight recorded data is adjusted to: N_1 99 percent and PTIT 825 degrees centigrade. Required torque at that PA and temperature was 87 percent. Line 2 of figure 1 shows the proper entries for this baseline TEAC.

Example 2: Engine LE 19123 had a high HIT check (plus 35 degrees centigrade). After performing all required inspections and maintenance, no fault could be found to cause the high HIT check. To determine engine performance, a normal TEAC was performed on 12 Dec 1984. Topping data: PA 4,000 feet, OAT minus 10

(c) NORMAL TEAC. Enter N_1 from the last BASELINE TEAC corrected for temperature.
5g. TORQUE ACT REQ.
(1) ACT. Enter the torque recorded in-flight.
(2) REQ. Enter the torque required as determined from the appropriate TEAC charts.
5h. EGT/PTIT ACT REQ.
(1) ACT.
(a) Initial entry. EGT/PTIT from the engine run sheet/data plate.
(b) BASELINE TEAC. Enter EGT/PTIT recorded in-flight corrected for temperature. This becomes the BASELINE EGT/PTIT.
(c) NORMAL TEAC. Enter EGT/PTIT recorded in-flight.
(2) REQ.
(a) Initial entry. No entry.
(b) BASELINE TEAC. No entry required. Maximum EGT/PTIT allowed may be entered.
(c) NORMAL TEAC. Enter EGT/PTIT from the last BASELINE TEAC corrected for temperature.
5i. REMARKS. Briefly explain why the TEAC was performed. Indicate whether it was a normal or baseline TEAC. For a baseline TEAC, also add the N_1 and EGT/PTIT actually recorded in-flight.

How to fill out a DA Form 2408-15 (Overprint for Turbine Engine Analysis Checks (TEACs)) (T55-L-712 engine) Complete Instructions By Block Number and Title.

1. MODEL. Enter the engine type, model and series.

2. SERIAL NUMBER. Enter the engine serial number.
3. PAGE NO. Enter the page number.
4. NO. OF PAGES. Enter the total number of pages. You can use a black lead pencil for this entry.
5a. DATE. Enter the calendar day, month and the last two digits of the year that the entry was made or the test was completed.
5b. ACFT SER NO. Enter the complete aircraft serial number.
5c. ENG TSO. Enter the cumulative time since new or last overhaul on the engine.
5d. OAT. Enter the actual outside air temperature (OAT).
5e. PRESS ALT. Enter the altimeter reading with barometric pressure indicator set at 29.92 inches Hg.
5f. N_1 PERCENT ACT REQ.
(1) ACT.
(a) BASELINE. N_1 recorded in-flight.
(b) PAC. No entry.
(2) REQ.
(a) BASELINE. N_1 percent determined from chart.
(b) PAC. No entry.
5g. TORQUE ACT REQ.
(1) BASELINE. No entries.
(2) PAC. Enter torque recorded in-flight under ACT column.
5h. PTIT ACT REQ.
(1) BASELINE.
(a) ACT. Enter PTIT recorded in-flight.
(b) REQ. Enter 885 degrees centigrade.
(2) PAC.
(a) ACT. Enter PTIT recorded in-flight.
(b) REQ. Enter PTIT determined from chart.
5i. REMARKS. Briefly explain why TEAC/PAC was performed.

degrees centigrade, N_1 97.8 percent, torque 95 percent, PTIT 810 degrees centigrade. By applying the correction factors to the last baseline TEAC done on 2 Aug 1984, required N_1 was 97.5 percent and required PTIT was 800 degrees centigrade. Line 3 of figure 1 shows the proper entries for this normal TEAC.

Example 3: A T55-L-712 engine, serial number LE 19372K was installed on aircraft 83-23385 on 27 Oct 1984. Time since overhaul (TSO) was zero hours. The aircraft was topped at 2,000 feet pressure altitude with an OAT of plus 10 degrees centigrade. Recorded inflight N_1 was 104.2 percent and PTIT 870 degrees centigrade. The required N_1 for the OAT was 104.5 percent. Line 1 of figure 2 shows the proper entries for the baseline TEAC.

Example 4: Aircraft 83-23385 completed its number 15 PPM on 23 Jul 1985. Engine LE 19372K had been flown for 153 hours. A PAC was completed at 2,000 feet pressure altitude, OAT of plus 20 degrees centigrade; 46 percent torque was needed to maintain 125 knots. PTIT was 610 degrees centigrade. Required maximum PTIT was 645 degrees centigrade. Line 2 of figure 2 shows the proper entries for a PAC.

If you have any questions about entries to the DA Form 2408-15 overprinted TEAC for the T55 series engines or any other engine, write to Commandant, USAALS, ATTN: ATSQ-ESM, Ft. Eustis, VA 23604-5431 or call AUTOVON 927-3266/4164.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Dawna Salazar

ALSE Items of Interest

We are managing Aviation life support equipment (ALSE) as a system and are seeing a surge of interest and strong support for this critical area. Mr. Nick Montanarelli, Army Materiel Command (AMC) headquarters in Alexandria, VA, and DCSLOG-AV (Captain Lou Bonham) are helping us to give this area more visibility. Recently, the AMC Aviation Safety and Standardization Team has added a lieutenant colonel for ALSE with the responsibility to participate in all Aviation safety and standardization visits to give support and identify problem areas that we can work on and resolve. We also participate in U. S. Army Forces Command, U. S. Army Training and Doctrine Command and Army National Guard Aviation safety and standardization meetings to review and identify ALSE problems. This gives us a "leg up" in this critical area.

Survival Kits

We constantly receive requests to identify them and below is a listing of current survival kits. When you have survival kits to be turned in, they should be sent to New Cumberland (AN5) Army Depot only.

NSN	DESCRIPTION
1680-00-973-1861	Survival Kit, Individual—Hot Climate
1680-00-973-1862	Survival Kit, Individual—Cold Climate
1680-00-973-1863	Survival Kit, Individual—Over-Water
1680-00-148-9233	Survival Kit Seat: Aircraft Cold Climate
1680-00-148-9234	Survival Kit Seat: Aircraft Hot Climate
1680-00-140-3540	Survival Kit Seat: Aircraft Over-Water
1680-00-205-0474	Survival Kit, Individual Vest: Large
1680-00-187-5716	Survival Kit, Individual Vest: Small

Point of contact for these survival kits at U.S. Army Aviation Systems Command, St. Louis, MO, is Mr. LeRoy Mauller, AMSAV-SAIA, AUTOVON 693-3809 or Commercial (314) 263-3809.

SRU-21/P Survival Vest Adopted By Navy

The Navy has recently alerted this office that they are going to start using the U. S. Army SRU-21/P in lieu of the SV-2B vest for special mission operations. The Navy approval was for NATRACOM TH-57 aircrews and HH-3 fleet overland search and rescue units for overland flights only. Army Technical Manual (TM) 55-1680-317-23&P will be used as an interim manual for maintenance and inspection. This certainly speaks well for the Army SRU-21/P vest.

Flight Clothing Care/Preservation

Take care of your flight clothing and it will take care of you. Aircrew personnel should not neglect their flight clothing—especially the gloves. They suffer more wear and tear than most other Nomex garments simply because they are always where the action is. Dirt, grease, grime, hydraulic fluid, oil—

you name it and your gloves get in it. Grease, oil and hydraulic fluid, in particular, will destroy their flame resistant properties.

Hand launder your gloves like it says in TM 10-8400-202-13 by putting them on and washing them with soap and warm water just as if you were washing your hands. Rinse with more warm water, then remove them from your hands and squeeze the water out. Don't wring or twist them. Machine washing is OK, too. Drip-dry or toss them in the dryer with other garments. Then stretch them back into shape.

Use saddle soap, national stock number 7930-00-170-5467, to keep the leather palms from getting hard, crusty or brittle. NEVER use petroleum base lubricants on them!

Take care of your flight clothing and gloves and they will be useful when you need them.

Slippery Survival Gear

Slippery survival gear could also apply to the Army. According to the Navy's weekly summary, a couple of maintenance workers on the deck of a carrier were unexpectedly blown overboard by the jet exhaust of a turning aircraft. They were properly attired in survival gear, but once in the water, they experienced great difficulty in opening their sea dye marker packets. One of the survivors managed to work one packet partially open; the other crew person couldn't open his. The men said the sea water made their hands slippery and this required excessive force to even partially open the varmints. The "dunkees" and their commanding officer invite you to deploy a sea marker with wet hands—it's certainly an eye opener. Guess where the Army and Air Force get their sea dye markers—from the Navy.

Wet hands can complicate using some of the other treasures hidden in our survival kits. Many pilots have commented about the difficulty they had releasing the Koch fittings on the parachute risers while wearing wet flying gloves. Could you release yours? Think about it. Now that more units are scheduling annual water survival training, maybe we could consider including slippery hands-on training.

If you have a question about personal equipment or rescue/survival gear, write PEARL, AMC Project Officer, ATTN: AMCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-1218/9 or Commercial 314-263-1218/9.

The Army Aviation Punch Bowl Ceremony printed in the June 1985 Aviation Digest is available for your unit's use in appropriate Army Aviation functions such as dinings-in or dinings-out. Seventy slides support the narration. Each is numbered and keyed in on the side of the manuscript. The Aviation Digest has several sets of these slides and copies of the keyed manuscript for loan. Write the Aviation Digest at P.O. Box 699, Ft. Rucker, AL 36362-5000, and tell us when you need the slides and when you will return them. You can call us at AUTOVON 558-6680 to request the slides. Our commercial number is (205) 255-6680. Be sure to allow enough lead time for us to mail the slides to your unit. And remember, when you have used the slides, return them to the Aviation Digest as soon as possible. There may be others waiting to use them.

AVIATION PERSONNEL NOTES

New Chief of Aviation Assignment Branch

LTC Gerald L. Crews recently has been assigned to Military Personnel Center (MILPERCEN) as the branch chief for commissioned officers. He comes from his last assignment as commander, 502d Combat Aviation Battalion, 2d Armored Division, Ft. Hood, TX. LTC Crews also has served in staff positions and commanded in Vietnam, Europe and continental United States with other assignments as an Inspector General, U. S. Army Recruiting Command (USAREC) area commander and aide.

Other new members of the Aviation Branch team and their most recent assignments are: MAJ Mitch Johnson, 2d Armored Cavalry Regiment; MAJ Bill Whittingstall, 3d Armored Cavalry Regiment; CPT Jim Rabon, 82d Airborne Division; and CPT Bob Carter, 6th Cavalry Brigade.

Your new points of contact for commissioned officer assignments are as follows:

LTC Gerald Crews—Chief, Aviation Branch
AUTOVON 221-0433/7822/9366

MAJ Mitch Johnson—LTC Assignments/Branch XO
AUTOVON 221-7822/9366

MAJ Bob Demers—LTC Assignments
AUTOVON 221-7822/9366

MAJ Pat Oler—MAJ (15T)/Functional Area Assignments
AUTOVON 221-0433/9366

MAJ Bill Whittingstall—MAJ (15) Assignments/
Reserve Officers' Training Corps (ROTC)
AUTOVON 221-0433/9366

CPT John Barton—CPT Assignments:
Functional Area/ROTC/USAREC
AUTOVON 221-7822/9366

CPT Jim Rabon—CPT (15 and 15T) Assignments (MEL 6)
AUTOVON 221-0433/9366

CPT Bob Carter—LT Assignments and Aviation Officer Advanced Course
AUTOVON 221-0433/9366

Ms. Jean Arnold—Aviation Officer Basic Course and Initial Entry Rotary Wing Training
AUTOVON 221-0433/7822/9366

Your points of contact for Aviation Plans and Programs are:

MAJ Tom Stewart—Aviation Training Requirements/
Aviation Career Programs
AUTOVON 221-8156/8157

MAJ Stan Hinds—Aviation Career Programs/Army Aviation Engineering Test Pilot Training/Army Astronaut Candidate Program
AUTOVON 221-8156/8157

SGM Bernard Berger—Aviation Schools
AUTOVON 221-8156/8157

Mr. Austin Pease—Aviation Career Incentive Act/Gate Time/Flight Pay
AUTOVON 221-8156/8157

Mrs. Margie Brown—Flying Evaluation Boards/
Medical Waivers
AUTOVON 221-8156/8157

Mrs. Rene Barnes—Secretary/Information
AUTOVON 221-8156/8157

Aviation Branch Files Review

Appointments for a branch interview are not required. However, it is recommended that you call MILPERCEN the morning of your visit to confirm that the branch representative you wish to see will be present. Also, to view your official microfiche and current officer record brief (ORB), you must give us a call at least 5 days in advance in order to obtain these documents in time for your visit. You may make an appointment by calling your assignment officer at one of the numbers listed previously.

Microfiche Copy of Official Files And ORB

These documents can be obtained by writing to MILPERCEN, ATTN: DAPC-MSR, 200 Stovall Street, Alexandria, VA 22332-0400. Copies are mailed directly to you, about 3 to 4 weeks after request.

Officer Efficiency Reports (OERs)

Active Duty officers with questions relative to receipt of OERs at MILPERCEN or senior rater profiles pertinent to OERs in their files should call:

A to K—AUTOVON 221-8667/8668

L to Z—AUTOVON 221-8669/8670

AH-64 Apache Flight Candidates

If your Army career will involve flying the sophisticated AH-64, you need to be aware of two medical prerequisites for participation in this program. First of all, because of the ocular hazard involved in operating laser systems on the AH-64, aircrews will be required to wear laser protective eyeglasses. If you now wear corrective lenses while flying, you'll have to notify Ft. Rucker 60 days in advance of class attendance so that the appropriate prescription can be applied to these lenses. When you're notified of class attendance, you need to send your current prescription with your name, rank, social security number, class number and class start date to the EENT Clinic, P. O. Box 14119 (SP4 Sison), Lyster Army Hospital, Ft. Rucker, AL 36362-5000.

The second medical aspect involved in flying this aircraft is ensuring that you have the correct head size for the Integrated Helmet and Display Sight System. No, you can't shrink or enlarge your head, but in light of this requirement, you've got to be measured by aeromedical personnel prior to entering this program. Shortly, teams of aeromedical experts from the U. S. Army Aeromedical Research Laboratory will be arriving at selected commands to measure your head. The results of these measurements will be maintained by the U. S. Army Aeromedical Center, and MILPERCEN will use them to determine if you meet the necessary medical parameters for participation in the program.

If you have any questions regarding these medical aspects of flying the AH-64, consult your local flight surgeon and look for the screening teams when they arrive in your area.

Lieutenant Colonel Command Eligibles

In October of this year, a message was sent to all military personnel offices (MILPOs) announcing the fiscal year 1987 LTC level command selection boards. If you are being considered for selection and your local MILPO has not provided you a copy of this message or you have not been informed of the contents, you should contact your local MILPO for a copy of the message. The Combat Arms Board will meet from 14 January 1986 to 14 February 1986, the Combat Support Arms Board from 21 January 1986 to 7 February 1986 and the Combat Service Support Board from 11 February 1986 to 28 February 1986.

Command selection boards have been directed to consider an officer's flying experience as one factor in their deliberations. Therefore, the Deputy Chief of Staff for Personnel has directed that an up-to-date copy of the DA Form 759, Individual Flight Record and Flight Certificate-Army, be provided to the selection boards.

In view of this requirement, all aviators in the zone of consideration for Aviation command are required to provide the most recent copy of their DA Form 759 to Commander, MILPERCEN, ATTN: DAPC-OPA-CV, 200 Stovall Street, Alexandria, VA 22332-0400, not later than 20 December 1985. Questions regarding this matter may be directed to MAJ Stewart at AUTOVON 221-8156 or 8157.

J-LASER

Major Thomas M. Horner
TAC-TRADOC Air-Land Forces Application Agency
Langley Air Force Base, VA

To marry the Army's ground/vehicle laser locator designator mobile system with the Air Force's airborne laser receiver system, a joint test force was formed to determine the overall feasibility of joint laser interoperability. This article takes a brief look at the J-Laser concept and the proposed J-Laser pamphlet scheduled for distribution in December 1985.

IN EARLY 1980, as the Army was about to field its ground/vehicle laser locator designator (G/VLLD) mobile system, the need for joint Army-Air Force target designation and handoff procedures surfaced.

The Air Force's Tactical Air Command (TAC) and the Army's Training and Doctrine Command (TRADOC) recommended that the Air-Land Forces Application Agency (ALFA) host a joint work group to develop procedures for using the G/VLLD in conjunction with the Air Force's Pave Penny, an airborne laser receiver system that alerts the pilot to target location. The TAC/TRADOC working group met in June 1980. A byproduct recommendation of the meeting was to expound the joint laser efforts beyond these two systems at a future date.

In March 1983, the Office of the Secretary of Defense chartered a joint test force (JTF) to determine the effectiveness of joint laser procedures for target engagement. By August 1983, the JTF had completed considerable background investigation on joint laser procedures. Together, the ALFA and JTF directors concluded that the procedures developed to date were developed in piecemeal fashion, not widely distributed, and not universally applicable.

Based on this background, the Joint Actions Steering Committee (JASC) in September 1983 tasked ALFA to form another joint work group to determine four-service procedures required for the integrated use of any mix of laser designators with target acquisition systems

and laser guided munitions. The JASC directed ALFA to emphasize close air support during this session.

In December 1983, representatives from TAC, TRADOC, the Navy Atlantic Fleet (LANTFLT), Marine Corps Development and Education Center (MCDEC) and the Readiness Command (REDCOM) met. Thus, J-Laser became ALFA's first four-service project. The meeting's ultimate objectives were to produce a four-service pamphlet describing the J-Laser concept, and to develop the required tactics, techniques and procedures necessary for joint laser interoperability.

To accomplish the objectives, the working group looked at a wide variety of laser systems currently in the field and those programed to enter the inventory over the next several years.

The working group also examined the various command, control and communications aspects of the joint laser problems, system capabilities, and the tactics and procedures necessary to ensure effective employment of these unique systems. The four services jointly considered both single and multisystem applications.

The working group found the services differed in their request procedures for laser guided munitions, in their coordination of pulse repetition frequency codes or laser switch settings, in their terminology, and in their target acquisition and tracking requirements. While these service differences were slight in most cases, they were sufficient enough to inhibit full realization of laser system capabilities in joint operations.

The joint working group has drafted a J-Laser pamphlet containing these five chapters:

1. Concept.
2. Planning Considerations.
3. Procedures.
4. Laser Designation and Weapon Switch Settings (Codes).
5. Safety.

The pamphlet emphasizes four areas and details joint laser operations using any mix of ground and airborne designation and acquisition systems for the delivery of laser guided munitions. The four areas emphasized are:

- Planning Factors.
- Laser Operations Procedures.
- Pulse Repetition Frequency Codes.
- Laser System Capabilities.

The draft pamphlet has undergone internal work group staffing; completed headquarters staffing at TAC, TRADOC, LANTFLT, MCDEC and REDCOM; and completed worldwide staffing at major command headquarters.

The proposed pamphlet has been completed and was forwarded for commanders' approval and signature. Publication will be completed within 6 weeks after the last signature is received. Pamphlet will be distributed in December 1985.

Note: The following ALFA articles published in the *Aviation Digest* can be obtained by writing to *Aviation Digest*, P. O. Box 699, Ft. Rucker, AL 36362-5000, or by calling AUTOVON 558-6680 or FTS 533-6680:

- "ALFA Agency," March 1985.
- "Joint Attack of the Second Echelon," April 1985.
- "Joint Tactical Deception," May 1985.
- "Joint-Rear Battle," June 1985.
- "Joint Application of Firepower (J-Fire)," July 1985.
- "Airborne Warning and Control System—Army Voice Operating Procedures," October 1985.

Mission of the Internal Instructional Systems Evaluation Branch, Evaluation Division, Directorate of Evaluation and Standardization

Captain Roger L. Lewis
Commander
Internal Instructional Systems Evaluation Branch
Directorate of Evaluation/Standardization
U.S. Army Aviation Center
Fort Rucker, AL

WHEN THE ACRONYM DES is mentioned, there is little doubt among pilots in the Army Aviation community as to what is meant. They understand the function of DES as it relates to them: evaluations of pilot proficiency, maintenance, safety, records, etc. What many people may not be aware of, however, is that DES performs several other important functions besides those generally associated with the worldwide Department of the Army (DA) evaluation mission conducted by the Flight Standardization Division of DES. One less well-known element of DES is the Evaluation Division, consisting of an External Instructional Systems Evaluation Branch and an Internal Instructional Systems Evaluation Branch.

The External Evaluation Branch is concerned with collecting and analyzing data from the field, primarily through the Aviation Standardization and Training Seminar/Branch Training Team (ASTS/BTT) visits. An ASTS/BTT update is contained in the "DES Report to the Field," published in the May 1985 issue of *Aviation Digest.* Probably the least known of all elements within the directorate is the Internal Evaluation Branch, which is the subject of this article.

The Internal Evaluation Branch is responsible for evaluating U.S. Army Aviation Center training products through the conduct of various internal evaluations. Data are collected to assess student progress, standardization and quality control in order to improve the quality of instruction at the Aviation Center. This includes collecting pertinent progress, process and performance data as well as information from students, instructors, developers, the field and other informed sources.

The principal question to be answered in Internal Evaluation is: Does the instruction provide students with the necessary knowledge and skills to meet training objectives in a satisfactory manner? To answer this question, the Internal Evaluation Branch employs various methods to collect data at the Aviation Center, some of which are:

- **Test Item Analysis Program:** This program collects and analyzes results of course examinations and provides results to appropriate training departments so that they may improve instructional processes.
- **Student Critique Program:** The Internal Evaluation Branch reviews and manages the Student Critique Program for the Aviation Center. Student critiques for all courses are reviewed so that significant trends can be identified and recommendations or assistance provided to the appropriate training department.
- **Classroom Evaluation Program:** Onsite evaluations are conducted to evaluate formal instruction at the Aviation Center for training effectiveness and to ensure compliance with U.S. Army Training and Doctrine Command and the Aviation Center governing regulations. A minimum of 12 unannounced classroom evaluations are conducted jointly per week by DES and the Directorate of Training and Doctrine.

Additionally, significant data are gathered at Ft. Rucker through interviews, questionnaires, hands-on component testing, review of programs of instruction (POIs), train-

ing support materials and Aviation Center proponency doctrinal materials.

The primary emphasis in the above data gathering procedures is to detect possible training problems that may exist at the Aviation Center. It cannot be overemphasized at this point that you, the field units, are the only true evaluators of the Ft. Rucker product. Therefore, data gathered from the field becomes the most important and reliable basis for recommending valid improvements to the training process. Sources available to DES that identify problems from the field are:

- Aviation Standardization and Training Seminar
- Branch Training Teams
- Graduate Questionnaires/Surveys
- DA Evaluations.

The Internal Evaluation Branch ties the above internal and external sources of data together by managing the Aviation Center training evaluation strategy (TES). The TES is a four-step process for managing our training evaluation responsibilities. A discussion of each step follows:

• **Problem Area Detection:** To recommend improvements to the training process, we must first detect a problem or identify a better method of conducting the training. This step takes place during the internal and external data gathering procedures mentioned. Once problem areas and trends are identified, they are compiled and prioritized based on manpower and resources available. At this time, a decision is made by DES concerning which areas will be pursued during the next quarter.

• **Identification/Verification of the Cause of the Problem:** Once a potential problem is detected and the decision is made to pursue that problem, we must identify its "real" cause before recommending corrective action. This requires additional research in the form of independent evaluations/studies that take one of the following forms:

Type 1: These assessments require a review of portions of a POI associated with a particular class, as well as observation and evaluation of the particular class, along with the associated training materials. This appraisal is normally conducted by one individual.

Type 2: These evaluations are similar to a Type 1, except the POI review includes the entire block of instruction, and classroom evaluations are conducted for all classes within the particular block of instruction to identify problem areas. This type review is normally conducted by two or more individuals.

Total Course Evaluation: These evaluations are the most complex of all, requiring an average of 700 manhours or more to complete. The total course evaluation requires developing a study plan, inspecting course development documentation material, evaluating all blocks of classroom instruction, reviewing the entire POI, reviewing all training materials, conducting test item analysis, developing and administering questionnaires and conducting interviews. When all data have been compiled and analyzed, conclusions and recommendations are made in the final study report. The Internal Evaluation Branch is currently conducting total course evaluations of the Aviation Officer Basic Course and the Aviation Officer Advanced Course.

• **Recommendation for Change:** Once the cause of a problem has been identified and verified, DES must make a recommendation for improvement to the appropriate training department. Recommendations are based on the above evaluations/studies and must be capable of correcting the cause of the problem as opposed to reacting only to the problem itself.

• **Follow-up Action:** Follow-up action is conducted by DES to ensure that training problems are resolved and that recommended improvements are accomplished. Follow-up action is normally conducted within 30 days after a recommendation for change is made.

The Internal Evaluation Branch exists solely to ensure that the Aviation Center training programs and materials are current, correct and appropriate to produce quality graduates necessary for your unit's combat readiness. Again, *information and problem areas that you report are the most important source of data* we receive and will be investigated thoroughly. Any questions or requests concerning the Internal Evaluation Branch, DES, may be made by calling AUTOVON 558-4691/6571, FTS (205) 533-4691/6571 or by writing DES, ATTN: ATZQ-ES-E, Ft. Rucker, AL 36362-5000.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362-5000; or call us at AUTOVON 558-3504, FTS 533-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hotline, AUTOVON 558-6487 or 205-255-6487 and leave a message.

HELICOPTER GUNNERY

WHEN ARMY AVIATION became a branch on 12 April 1983, the wheels were set in motion to draw all proponency for Aviation related subjects into the home of Army Aviation—the Aviation Center at Ft. Rucker, AL.

In October 1984, a staff study identified the need to consolidate all weapons and gunnery activities under one roof. The Department of Aviation Subjects became the Department of Gunnery and Flight Systems (DGFS) in December 1984, creating and adding the Weapons and Gunnery Division. This division pooled resources from the Aviation Division and Flight Simulation Division of DGFS as well as from the Directorate of Training and Doctrine.

The weapons and gunnery division develops, conducts and evaluates performance-oriented instruction on aircraft and weapons systems for U.S. Army attack and advanced attack helicopters. It also maintains Armywide proponency for aerial range and gunnery operations, standards in training commission, multipurpose range complexes and Field Manual 1-140, "Helicopter Gunnery." The division is divided into the following three branches:

Weapons and Gunnery Systems Branch (WGSB). This branch contains the division's academic instructors who teach the basic aircraft systems, mission systems and avionics for the AH-1S Cobra and AH-64 Apache aircraft. The Cobra section consists of a noncommissioned officer in charge (NCOIC) (E7), a training specialist (GS-11) and three academic instructors (GS-9s). The AH-64 section includes an NCOIC (E7), a training specialist (GS-11), a senior instructor (GS-11) and six academic instructors (GS-9s).

Weapons Simulation Training Branch (WSTB). The AH-1S flight weapons simulator, the AH-64 cockpit/weapons emergency procedural trainer and, in the near future, the AH-64 combat mission simulator are some of the systems used in this branch to train pilots in emergency procedures, tactics and mission equipment management. The simulation training is a building block process which gives students the opportunity to use skills previously learned.

Range and Gunnery Operations Branch (RGOB). This branch maintains the Armywide proponency for aerial ranges and gunnery operations. It provides Aviation input and subject matter expertise for the generic design of the multipurpose range complexes to be constructed at Army installations worldwide. RGOB also has the lead responsibililty for the development, review and revision of Aviation standards in training commission. Recently it was made the lead agency for integration of Army Aviation at the National Training Center.

Units with questions pertaining to any of the previously mentioned areas of expertise are invited to call Weapons and Gunnery Division at AUTOVON 558-4005/2030. Key people to speak to are Lieutenant Colonel James A. Benton (division chief), Captain Jim Mize (chief, WSTB), Captain Jim Minchew (chief, WGSB) and Captain Dennis Sheppard (chief, RGOB). These and other subject matter experts will be happy to provide you with an answer. If it has a rotor system and shoots, Weapons and Gunnery Division, DGFS, is the source of assistance and information for the newest and best combat branch in the Army! Air Attack!

At Your Service—

The Army Aviation Center's

Weapons and Gunnery Division

Captain Alan L. Moloff, D.O.
Major Stephen E. Piwinski, M.D.

LOSE INCHES OFF your waist while you sleep.
Massive biceps in only 10 minutes a day.
Legs of iron without leaving your house.

These statements are just a small sampling of the many "come on" phrases seen daily in advertisements for exercise equipment and fitness programs. It is very tempting to invest time, effort and money in these seemingly quick-fix fitness schemes. Fitness, like the magic phrase "getting into shape," means different things to different people. Marathon runners, gymnasts, football players, sprinters and body builders all have different concepts of what fitness is and the best way to attain their goals. This article discusses some basic concepts needed to formulate fitness goals and training programs.

What is your fitness goal? Do you want to add muscle, increase strength, look better or improve your cardiovascular (CV) status?

Cardiovascular fitness is the place to start. CV fitness, simply speaking, is the efficient oxygen transport to the muscles by the blood, heart and lungs. There are many benefits to be gained by improving your CV fitness, including reduction in the risk of heart disease (arteriosclerosis and coronary artery disease) and decreased risks of hypertension, obesity and some forms of diabetes. Many exercise physiologists and exercise enthusiasts also claim improved physical and psychological well being, improved abilities to withstand physical and mental stresses and decreased fatigue.

For those that want to look better, a few fitness myths must be put to rest. A well-balanced diet is the best way to lose weight. Crash diets or fad diets will produce weight loss quickly but the results usually don't last. For example, certain commercial high protein, low carbohydrate diets yield a rapid weight loss the first week. This weight loss, however, is mainly due to water loss and muscle wasting—not loss of fat.

Many dietary aids contain stimulants such as phenylpropanolamine, which have been associated with palpitation, light headedness and nervousness in some users. Herbal type dietary aids contain mild laxatives and purgatives that promote weight loss by

increasing the frequency of bowel movements.

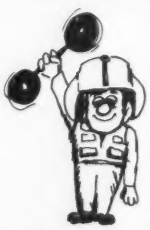
In the long term, modification of eating and exercise habits is required for consistent weight control. Second, there is no way to spot reduce fat without surgical intervention. Massagers, rubber suits, belts and rollers simply will not cause fat to disappear in selected areas. Different individuals have a tendency to accumulate fat on different parts of their bodies even though they are of normal weight.

Weight lifting, using either free weights or machines, will increase muscle size and strength. A moderate program will not make men or women look like Mr. or Ms. Universe. Women do not have enough of the male hormone testosterone to develop bulky muscles. Men must also realize that a body builder's physique requires many hours of exercise per day over a period of years to develop.

The increasing use of anabolic steroids as aids in developing muscle bulk is widely condemned by the medical community. These synthetic derivatives of testosterone are approved for use by elderly patients with osteoporosis (weak bones) or individuals on chronic hemodialysis. At the recommended dosages, a number of adverse reactions including decreased sperm counts, diabetes, abnormal liver functions, increased serum cholesterol, salt and fluid retention, and acne have been reported.

Many body builders follow the dangerous practice of taking anabolic steroids at dosages far in excess of the recommended levels. At these megadoses, case reports of psychosis, gastrointestinal ulceration and advanced coronary artery disease in young athletes exist. In accordance with Army Regulation 40-8, remember that use of dietary aids and supplements is considered self-medication and is not compatible with Aviation duties.

As pointed out, cardiovascular fitness has many benefits and should be used as the training base for other fitness programs.



The goal is to improve the efficiency of your heart and lungs in the delivery of oxygen to the muscles. CV fitness is achieved by performing a low resistance, high repetition workout for a period of 30 to 40 minutes, 3 to 4 times a week. The actual exercise performed is not as important as the repetition of the exercise for the prescribed time. For these exercise periods it is important to significantly elevate your heart rate from its normal resting level.

How high a heart rate do you need? You need to increase your heart rate to 80 percent of your maximum heart rate and maintain that rate for at least 30 minutes to receive the full benefits of a CV fitness program. The heart rate you need to achieve is determined by subtracting your age from 200 then multiplying by 0.8. (See the accompanying figure.)

Age In Years (Men & Women)	Desired Heart Rate
20	144
25	140
30	136
35	132
40	128
45	124
50	120

For example, a 30-year-old should get his heart rate up to 136 beats per minute for a period of 30 to 40 minutes, 3 to 4 times a week.

The intensity (heart rate), duration and frequency of the exercise sessions are the key to success in improving CV fitness. These standards (80 percent maximum heart rate, 30 to 40 minutes per session, 3 to 4 sessions per week) have yielded improved CV performance in as little as 4 to 6 weeks. Numerous studies performed on test subjects using these exercise standards have consistently shown marked improvement in CV fitness.

While most aviators are healthy, *all male and female aviators more than 35 years old should consult their flight surgeon before starting a CV training program.*

There is no best exercise to be used for CV training. The best exercise for you is the one that you enjoy most. The better exercises are those that provide continuous activity such as bicycling, running or swimming. It is difficult to achieve the exercise standards in sports like volleyball, baseball or football due to the stop and go nature of the sport. Sports such as tennis or racquetball may or may not meet the exercise standards, depending on the skill level of the participants.

Prior to each exercise session a warm-up period should be used to gradually stretch the major muscle

groups. Gradual progressive stretching exercises are best suited for the warm-up period. This gradual progressive stretching produces a number of benefits for the exercise participant. One of these is that the stretching actually does raise the temperature of the muscle (hence the term warm-up). Commercial ointments applied to the skin may feel good but only cause increased blood flow to the skin. While the skin may warm up, the muscle doesn't.

The old adage "no pain, no gain" is really not appropriate for a well-designed exercise program. Some muscle soreness will occur from time to time but this is an indicator of overtraining. If soreness does develop, take a day off. If soreness or pain persists, it is time to talk to your flight surgeon regarding your condition.

In summary, you should remember:

- **Cardiovascular fitness reduces your risks of certain diseases to include hypertension, heart disease and obesity.**
- **Cardiovascular fitness training should consist of 30 to 40 minutes, 3 to 4 times a week with a heart rate of 80 percent maximum.**
- **A warm-up should precede each workout session.**
- **Your flight surgeon should be consulted for specific diet or exercise suggestions and if pain persists or continually reoccurs 2 to 3 days after exercising.**

ABOUT THE AUTHORS

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Major Stephen E. Piwinski, M.D., M.C., is chief of aeromedical education at the U.S. Army School of Aviation Medicine.

U.S. Army Class A Aviation Flight Mishaps

	Number	Flying Hours (estimated)	Rate	Fatalities	Total Cost (in millions)
FY 85 (to 25 October)	3	106,056	2.83	0	$2.9
FY 86 (to 25 October)	2	104,290	1.92	0	$1.9

The Apache's Role in Army 2000 begins in the U.S. Army Training and Doctrine Command (TRADOC) and the U.S. Army Materiel Command (AMC) desert classroom.

TRAINING THE TRAINERS

The participants of the Instructor and Key Personnel Training School, from 18 March 1985 to 31 May 1985.

YOU CAN SEE it when you're still 30 miles down the road. It looks like the "keep" of some medieval baron's castle; a wind-sculptured watchtower, high up on a ridge, used by soldiers of an era long gone to watch for enemies of desert fiefdom.

On the map, it's marked as Castle Dome, a geological formation protruding up into the Arizona sky from a rocky, sage-covered ridgeline. At its base is Castle Dome Army Heliport, a keep, if you would, of a modern sort; a place where some of the most exciting and important work being done in Army Aviation in 1985 has been taking place.

Sited in the northern portion of Yuma Proving Ground, an AMC facility, Castle Dome is surrounded by harsh desert, with ridges forming an uneven rim out on the horizon. The area is an extension of the Sonora Desert, and it is hot! But how hot it is, down where the roadrunners are, is not the issue. What is really important is what went on up in the air, at Castle Dome and at Yuma during the late winter and spring. Army Aviation history was made.

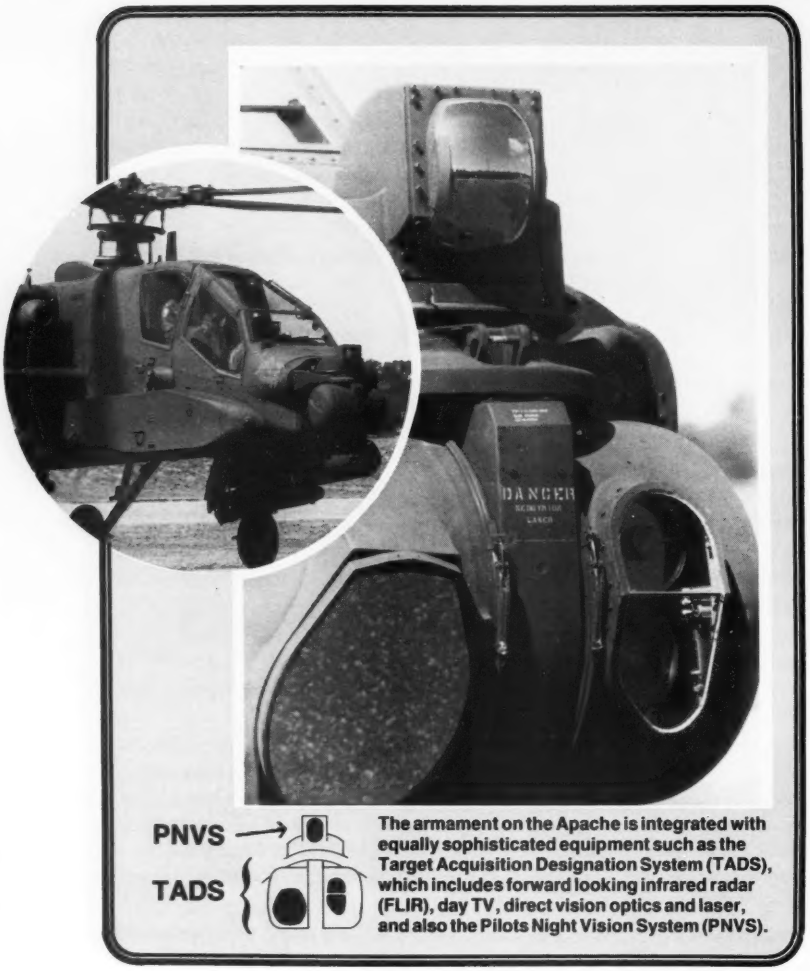
Helicopters are closely linked to Army Aviation history. These rotary wing aircraft have become sophisticated and are capable of many things, not the least of which is playing an important role in the active defense of our country. The latest version to be built for this specific purpose is the AH-64 Apache advanced attack helicopter (AAH); a two-place, heavily armed, highly maneuverable, technologically advanced aircraft.

Mr. Richard P. Fulton
U.S. Army Aviation Systems Command
Public Affairs Office
St. Louis, MO

Effective in August, Hughes Helicopters Incorporated, formally became the McDonnell Douglas Helicopter Company. It is the prime contractor for this important new Army Aviation modernization effort. The company facility is only a short flight from Yuma, east over the desert and mountains to Mesa, AZ, just outside Phoenix. Working with the Army, other agencies of the Department of Defense and other departments and agencies of the Government, and with many subcontractors, the prime contractor has pulled together a twin engine, rotary wing aircraft specifically designed to deliver antiarmor and area suppression fires in day, night and adverse weather.

The Apache, which McDonnell Douglas Helicopter Company is steadily rolling off the production line and

The Apache is an attack aircraft with highly sophisticated weapons systems such as:
HELLFIRE
30 mm cannon
2.75 inch rockets



The armament on the Apache is integrated with equally sophisticated equipment such as the Target Acquisition Designation System (TADS), which includes forward looking infrared radar (FLIR), day TV, direct vision optics and laser, and also the Pilots Night Vision System (PNVS).

out the hangar door, represents the optimum in helicopter technology for the modern arena of war. It looks like an elongated dragonfly, lacking the special touch of elegance in appearance that a high performance jet has. But, it does have a special toughness that allows it to exist down in the ground environment with infantry and armor; and enables it to fight enemy infantry and armor and come out a winner.

A lot has been written about the characteristics of the Apache, but it bears reviewing. Because it is an attack aircraft, the kinds of fire it can bring against any enemy should be mentioned first.

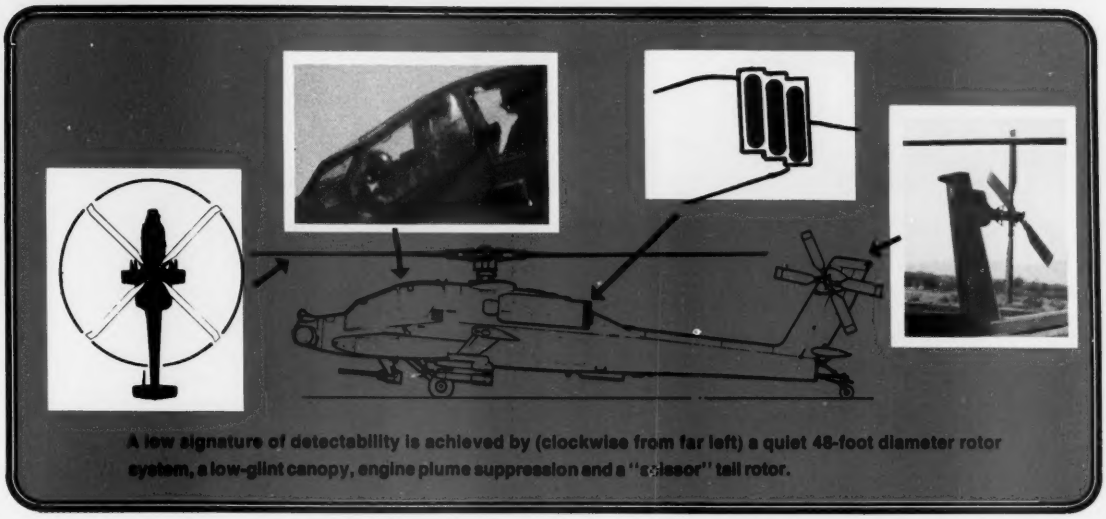
The Apache's primary point target weapon is the HELLFIRE antitank missile. A maximum 16 of these missiles, each capable of knocking out the heaviest tank in any nation's inventory, can be carried (8 mounted under each wing).

Suppressive fire is provided by a 30 mm M230A1 automatic cannon and 2.75 inch rocket subsystems. The cannon has a 1,200 round capability and can be reloaded in 10 minutes. It's mounted under the chin of the aircraft, is crash accommodating, has an azimuth left or right capability of 110 degrees, and an elevation capability from plus 11 degrees to minus 60 degrees. In other words, without even having to move the aircraft, Apache crewmembers have an exceptionally large cone into which they can fire this weapon, and it has an effective range of a long, long way. The aircraft can also mount storage pods for 76 2.75 inch rockets, if the HELLFIRE launchers are replaced.

All this armament is integrated with a highly sophisticated helmet and display sight system, a pilots night vision sensor (PNVS), and a target acquisition designation system (TADS).

TADS and PNVS were developed and are being produced by Martin Marietta Aerospace. These two independently functioning subsystems provide Apache crewmembers with advanced multisensor electro-optical fire control capabilities so they can detect, recognize and engage enemy targets at extreme standoff ranges. With TADS/PNVS, the Apache can do its job in conditions previously considered unworkable; it operates down among the trees, nap-of-the-earth, and beyond the range of primary threat weaponry. These two systems, TADS and PNVS, are major contributors to the Apache's battlefield effectiveness and survivability. They provide vital links among the aircraft, its weapons and its crew.

The AH-64A is the most survivable helicopter known. According to the AAH program manager (PM), Major General Charles F. Drenz, "This is



A low signature of detectability is achieved by (clockwise from far left) a quiet 48-foot diameter rotor system, a low-glint canopy, engine plume suppression and a "scissor" tail rotor.

achieved through a synergistic aggregation of high maneuverability and a rugged twin engine airframe highly tolerant of light cannon and heavy machinegun rounds. The redundant flight control systems, self-sealing fuel cells, armor plating of critical components and blast shields for the crew make the Apache an exceedingly survivable helicopter."

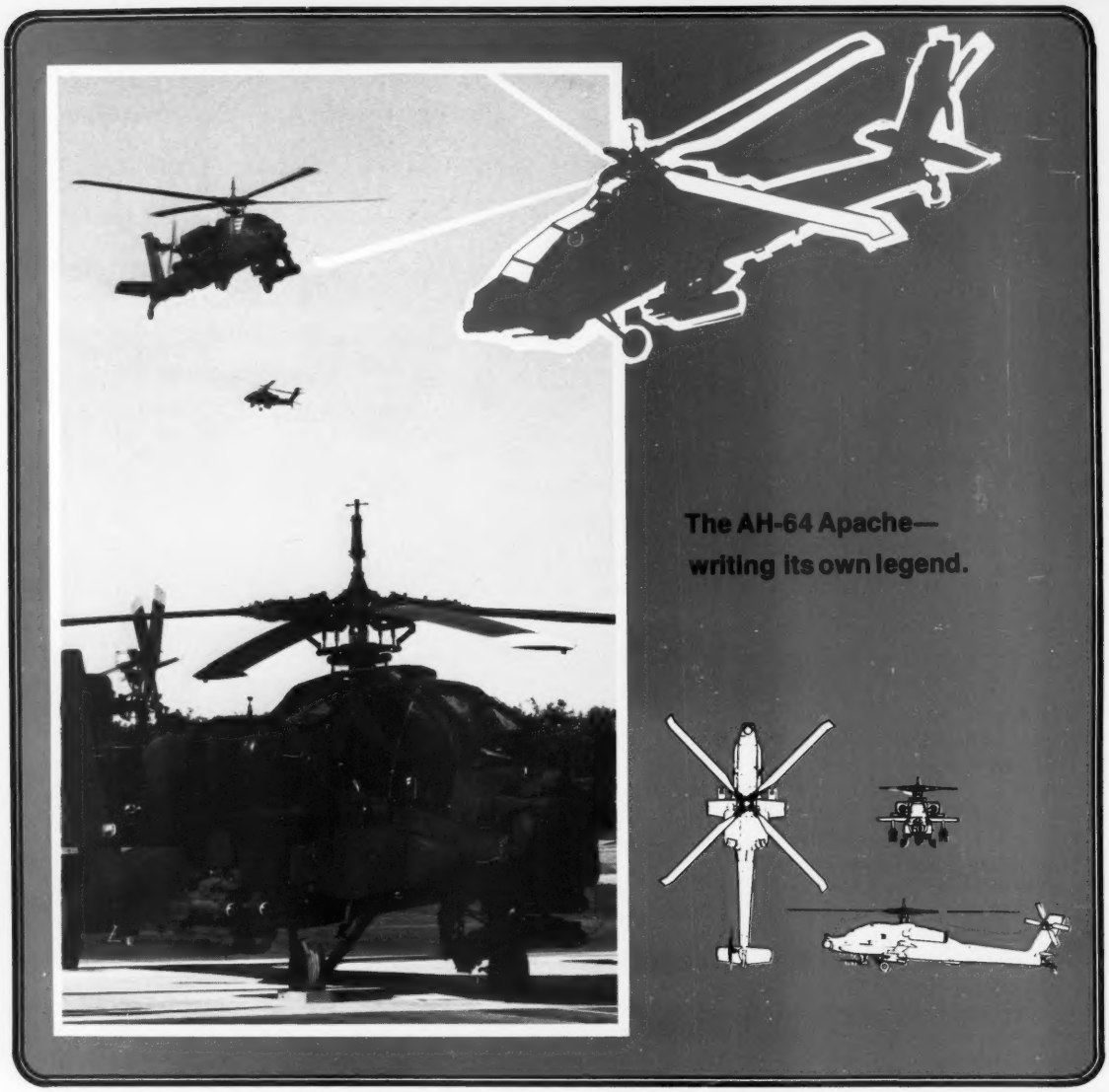
The general, writing about detectability, noted that the Apache has quiet rotor systems, a low-flicker rotor, low-glint canopy, contains composite airframe material, has a "scissor" tail rotor, an overall compact design and a new approach to engine plume suppression. This adds up to what in military terminology is called a low signature across the aural, visual, radar and infrared spectrum. Used in any combat situation, the enemy can be pounded from a point out of range of its guns, and will have difficulty telling where all the fire is coming from.

The Apache is a tough, no-nonsense aircraft that incorporates many recent technical advances into an Army Aviation system capable of winning any type of conventional engagement. Like the tough Indian warriors of the southwest for which the AH-64 is named, the Apache is an important part of the Army's current modernization drive.

Production-wise, this important aircraft is off to a good start. The Apache is beginning to write its own legend, and now it is time to complete the picture by bringing in the soldier—for whom the system is being built in the first place. That's why what has been happening out at Castle Dome, in the middle of the Arizona desert, is so important. The production line for the aircraft is working well, but a second "production line" (if you will) also is needed. It is a production line tooled up in proper fashion to competently and professionally train people with the high skills needed to *operate and maintain* the Apache.

As with building aircraft, building a pool of aviators to fly them has got to be a carefully thought out business. Through the years the Army has purchased many different types of aircraft, and has learned a lot about teaching soldiers to fly them in combat. It has been a steady process, and much has been learned about safety and educational methodology. This knowledge has been applied to a plan to bring the Apache on line in the most expeditious manner.

Under the auspices of the AAH PM office, a special school, called "Instructor and Key Personnel Training," or IKPT for short, was begun early in 1984. The plan materialized with the training of six instructor pilots—Army aviators—who were trained by the (then) Hughes Helicopters, Inc. in Mesa and other places, but particularly at Castle Dome. Army instructor pilots trained another seven in the second class. This highly specialized school's sole purpose was to train three classes of TRADOC people—Ft. Rucker, AL, aviators, ground instructors and cockpit weapons emergency procedure trainer instructors, who in turn



will teach those who will make up Army units flying the Apache.

Lieutenant Colonel David F. Sale, of the TRADOC System Manager—Attack Helicopter office, at the Aviation Center, Ft. Rucker, commanded Team Apache during IKPT-III. He said, "All the pilots in IKPT-III, like those in the previous two classes, are an extremely special group, coming from instructor pilot and standardization instructor pilot backgrounds. Ten of them have extensive backgrounds in (AH-1) Cobra operations and in the attack business. Hughes people trained the first class, and this group is being trained by IKPT-I and -II graduates—Army people training Army people.

"This particular class is unique," Sale said, "because we also trained Department of the Army civilians

(DACs) and Army NCOs (noncommissioned officers) who will be the combat weapons emergency procedures trainer (CWEPT) instructors, and who will be the ground school instructors. We had eight from each of these groups, and they took the same academics course that the pilots of IKPT-III had. These DACs (GS-7s and GS-12s) and NCOs (E6s and E7s), together with the instructor pilots, form the cadre that will teach our soldiers how to fly and fight the AH-64. When the regular AH-64 program began at Ft. Rucker last June, members of the cadre began working together for what will be at least 2 years. So the training taken together at Castle Dome was the start of a lot of good communication and coordination that will pay real dividends on down the road."

LTC Sale added that IKPT-III began 18 March 1985. It was scheduled to finish at the end of May, but finished a week early. "I attribute this to the 'can-do' attitude of everyone concerned," he said. "AMC, TRADOC, the prime contractor and subcontractor personnel, all pitched in, worked hard, and the end result was a smooth running operation. I think another reason why the class went so smoothly can be summed up by use of the word *maturity*. We had maturity of the aircraft, maturity in our use and understanding of the aircraft itself, and a lot of maturity displayed by Hughes and Martin Marietta employees who were maintaining the aircraft."

Chief Warrant Officer, CW4, Robert J. Sullivan of the Directorate of Evaluation and Standardization at Ft. Rucker, helped in the instruction of IKPT-III. He outlined the course the pilots took following the academic portion of the training: "Being an AH-1 Modernized Cobra pilot is a prerequisite to go to this school," Sullivan said. "These people all have a lot of hours in the air, so they really hit the ground running with this program. The first thing that happens is 24 hours of pilot night vision system training done on a Cobra surrogate of the Apache.

"We used Apache systems fitted to the Cobra because it was more cost effective for this particular part of the training. Seventeen of these hours were spent 'in the bag,' in a completely blacked-out cockpit, using the specialized sensory capabilities of the pilot night vision system. The remaining 7 hours of this block were spent in actual night flying. The next 11 hours were spent transitioning into the AH-64, followed by 9 flight hours of PNVS training and 18 hours of TADS/Gunnery. This was followed by two flight checks; one in the rear pilot's seat and one in the forward copilot-gunner's position. Then 18 hours were spent in combat skills."

The focus of combat skills was on individual crewmember proficiency. Sullivan said, "The goal of IKPT-III was to train people who in turn would be able to produce graduates capable of training aviators to their individual crew station proficiencies. When those students are handed to units from the course at the Aviation Center, they're ready to start team training at the unit level."

Both LTC Sale and CW4 Sullivan were pleased with the training situation at Yuma. That was readily apparent. They explained that Yuma Proving Ground has ranges that can accommodate the unique capabilities of the Apache. Sullivan said, "We did a lot of firing in a range called Yuma Wash. It is about 20 kilometers long and 4 to 10 kilometers wide. It has a lot of good tactical positions and masked positions. The targets we engaged were old sedan bodies. These cars were set up to simulate armored and lightly armored vehicles."

Talking about the tactical application of the Apache in any sort of operation, LTC Sale said, "The train-

At left, SFC Jose J. Solo-Rivera, one of the key NCO observers during IKPT-III, is an aircraft armament supervisor and will help field Apache units from Ft. Hood.

The Apache can go out at night, acquire and engage the target, and be on the way to a new position before the enemy knows he's been hit.

ing that IKPT has been doing takes into consideration all the different ways the aircraft could be used. Nighttime provides a tactical advantage for the AH-64, and night training is incorporated into the program. Of course, the aircraft can be used anytime, but the special advantage of night use is that the Apache can go out during the hours of darkness, acquire the target, engage the target and be on the way to a new position before the enemy even knows he is being hit. And we can engage at some very good ranges."

CW4 Sullivan joined in, "We can fire at longer ranges in a shorter amount of time and in adverse weather better than any other similar weapons system in the world."

Both men talked about a rather unique combat capability the Apache has that tremendously adds to its deadly effect. Suppose an Apache flying an actual mission, and headed toward its primary objective, passes near a good target of opportunity. The crew takes advantage of a unique tie-in between the fire control computer and the Apache's navigation system. The crew "lases" the secondary target and this stores the grid coordinates in a computer memory.

After hitting the primary target, the crew "calls up" the secondary target and the TADS sensor will point to that location. While that is a very good aspect, there is another use as well. LTC Sale said, "The crewmembers may see a target they might not want to hit, but using the system, they can bring back data on it—its position and so forth—for the intelligence people."

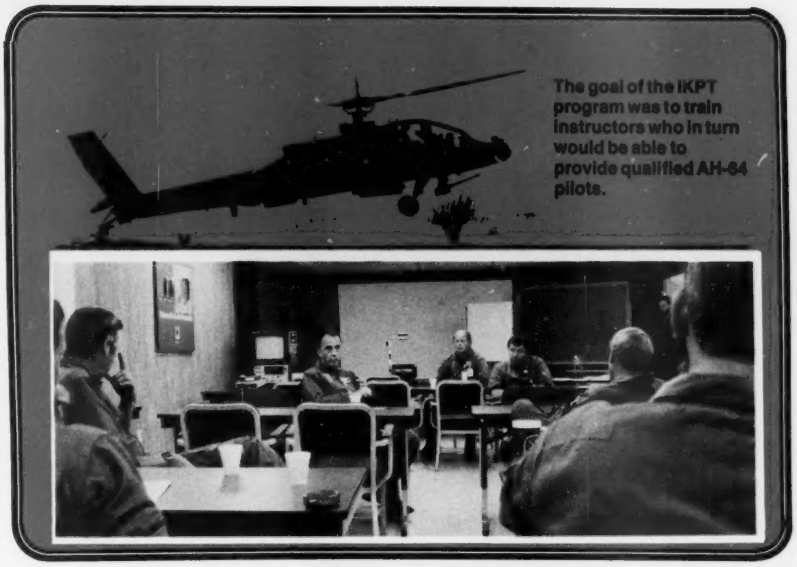
CW4 Sullivan added, "We now have another real-time intelligence tool—we can video tape everything that comes in through any of the sensors. Having that video tape recorder onboard is a real bonus."

LTC Sale said, "The tactics we'll use with the Apache are pretty much the same as what we use today with the Cobra, but we have a few more capabilities than with the Cobra. A team of Apaches, three to five aircraft, spread out across a 5-kilometer front is a lot of firepower." A primary goal of the combat skills portion of the training, and of the IKPT-III program overall, is to learn just how much

firepower the Apache packs.

Sullivan said, "We've needed this aircraft for a long time. It gives us a capability we've never had before. It is the first attack aircraft we have had that can carry a full load of armament and still fly a prolonged mission. It is a very survivable aircraft—very agile, very powerful, very deployable."

As the Team Apache commander, and as the senior TRADOC officer present at Castle Dome, LTC Sale summed up IKPT-III this way: "I think it says a lot for the Army—that we can develop with private civilian contractors such a professional *can-do* training relationship. This entire program, to teach those who will teach the Army how to fly and fight the Apache, has gone exceptionally well because of positive attitudes and cooperation. Excellent rapport and a strong sense of commitment made the program work the way it was intended. Every member of the Army and civilian team at Castle Dome should be proud."



The goal of the IKPT program was to train instructors who in turn would be able to provide qualified AH-64 pilots.

During IKPT courses, the Castle Dome flight line hummed with activity as fuel and ordnance were delivered, routine maintenance was performed and crewchiefs pampered the craft under their care. It is an impressive sight to be on the flight line just as the sun begins to crawl up over the horizon, and to watch six or more Apaches being armed and readied for an 0600 hours launch on a hot mission.

Sergeant First Class Jose J. Soto-Rivera, an aircraft armament supervisor assigned to the Apache Materiel Fielding Team at Ft. Hood, TX, was one of a group of key noncommissioned officers who were observing during IKPT-III. SFC Soto-Rivera had already completed formal training with the Apache armament systems and will be part of the team helping to field Apache units from Ft. Hood to Europe and to other locations.

The Army fielding plan is a single base deployment concept. Students taught at the Aviation Center by IKPT graduates go to Ft. Hood when they finish the AH-64 class. There they join AH-64 units being formed. They draw *all* of their equipment—everything from the Apache to jeeps, typewriters and tool kits. Unit training is conducted on Ft. Hood ranges, which are similar to the Yuma ranges—big, bleak, desolate, scruffy countryside. After a unit passes its Army Training and Evaluation Program test and is certified combat-ready, that unit deploys to its home station.

A lot of flying in an Aviation effort requires a similar intense effort on the ground. The McDonnell Douglas Helicopter Company's Syd Austin of Mesa, served as the company's site manager at Castle Dome. Another of its employees, Robert Irwin, managed the pilot training support effort there. The two worked closely during the Army's initial Apache flight training program. The prime contractor's Helicopter Training Department was well represented in the ground school and provided a lot of the training equipment needed, most notably the CWEPT trainer.

Austin explained that the CWEPT was a mockup of the Apache cockpit, hooked up to the computers with carefully tailored software that simulated a lot of Apache procedures. It enabled students to practice starting and running-up the aircraft engines, to perform emergency actions, to learn the locations and uses of the many different control switches (this training was called "switchology"), and to learn how to start, run-up and test the weapon systems. This allowed better use of time and resources when the students went into the actual cockpit. The two CWEPT trainers used at Yuma have been moved to the Aviation Center and are being used for the first regular classes of Apache students.

Austin noted that his company's Training Department provided plat-

form instructors for gunnery and maintenance students as well as for the aviators. He said, "Our primary effort, though, has been to support the flying portion. To do that we (Hughes) provided eight aircraft and mechanical and electrical experts, whom Bob Irwin supervised. Inspection people and RAM (reliability, availability and maintainability) data people were also part of our team out here."

Irwin, noting that the mechanical experts also doubled as armament specialists, said, "Our people are dual-rated. They did aircraft mechanical work at Yuma and they also took care of the guns. They could go from loading a cannon to working on the rotor head just like that." He added that many of the maintenance people were former military crewchiefs.

Austin summed up his company's involvement this way: "Our primary purpose at Castle Dome is to maintain the aircraft. LTC Sale and his people from TRADOC have operational control. They took care of operations and scheduled the training. Bob (Irwin) is the maintenance officer and has the job of keeping the aircraft in flyable status. They tell Bob how many aircraft they need and when—and he provides them.

"Our flight line people were the most experienced Apache maintainers in the business. The relationship among the AH-64 PM office, TRADOC and us is excellent," Austin said.

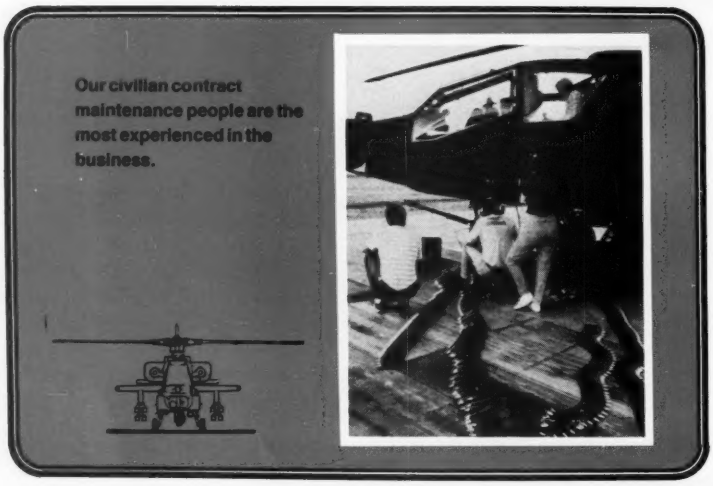
AMC's AAH PM office was represented at Castle Dome during IKPT-III by Lieutenant Colonel Dave Lum and Major Keith L. West Jr., both of whom are assigned to the Apache Materiel Fielding Team at Ft. Rucker. LTC Lum also serves at the Aviation Center as the TRADOC fielding team chief. The roles of these officers during the operation were to serve as representatives of the AAH PM office onsite, and to oversee the program which was primarily funded by AMC. They also served in a liaison capacity among the contractors, TRADOC and the Apache Army Plant Representative office in Mesa.

According to MAJ West, "Hughes has now taught the base of the Army's Apache instructor corps. They've given us the academic training and the lesson plans. We are now ready to begin regular AH-64 aircraft qualification courses at Ft. Rucker, and we'll soon be fielding the first units. The class has gone very well. We got ahead of schedule for a number of reasons and we are all very pleased with that."

As IKPT drew to an extremely successful close, Major General Drenz flew out for a visit with the class. He is a rated AH-64 pilot who has already done some cross-country flying with the Apache. The general visited with the class, trading Army Aviation stories with them, and gaining their views concerning the aircraft and its employment. During that informal discussion, one of the pilots in the class, talking about the many advancements represented by the Apache (particularly in the electronics field), made a statement that drew laughs, but was very apt. "This is a helicopter for the video-game generation," the chief warrant officer said.

His point was well taken. Tomorrow's soldiers who will fly the Apache in operational units are in the country's high schools and colleges today. With the surge of home computers and electronics that has been experienced the past few years, tomorrow's aviators have a head start in learning how to operate such a sophisticated aircraft.

They've got something else going for them as well. When they go to the Army Aviation Center to learn how to fly the Apache, they'll be taught by a cadre of extremely professional and experienced instructors who in the western desert of Arizona, under the "keep" known as Castle Dome, learned to fly and fight the world's best attack helicopter—the AH-64 Apache.



DEPARTMENT OF THE ARMY REGIONAL REPRESENTATIVES

BEING IN the Aviation business you may have heard of the U.S. Army Air Traffic Control Activity-Aeronautical Services Office (USAATCA-ASO) Department of the Army Regional Representatives (DARRs) during your past experience. The Army has six offices serving nine Federal Aviation Administration (FAA) regions, so some DARRs have to cover two regions. Army Regulation 95-50 covers DARR responsibilities, gives their locations, addresses and phone numbers.

Just what is the function of a DARR? DARRs serve the overall Army community in three major areas: airspace, Aviation operations and air traffic control (ATC). Take airspace for instance; the Army needs use of certain airspace bounded both laterally and vertically to conduct activities which could be hazardous to other airspace users. We fire artillery, air defense weapons, rockets and Aviation weapons to maintain our training and readiness. At depots and arsenals we test fire weapons for quality control and destroy munitions that have exceeded their life cycle. At our research and development facilities, we conduct tests of new weapons systems. All of these activities require airspace if they are to be successful.

Here's where the DARRs come in. The FAA is the keeper of the Nation's airspace and allocates it to accommodate the needs of all users to include the military departments. Paramount in this allocation is safety. We don't want to endanger civil airliners or general Aviation aircraft with our hazardous activities. The DARR negotiates with the FAA region for new Army airspace requirements, makes sure we are properly using the airspace we have, and works toward the goal of the most effective and safe use of the Nation's airspace.

The DARR is the Army's point of contact for airspace, but what about Aviation operations? DARRs have an inside seat in the FAA regions, so if you have any Aviation operation you are planning, but are not sure if it fully complies with FAA regulations, give the DARR a call. DARRs can check it out with the FAA staff and get an answer for you. Such things as paradrops, night vision goggles training, tactical instrument flight training, vertical helicopter instrument recovery procedures, flight violations, flight incidents, and the I Fly Neighborly Program are a few examples.

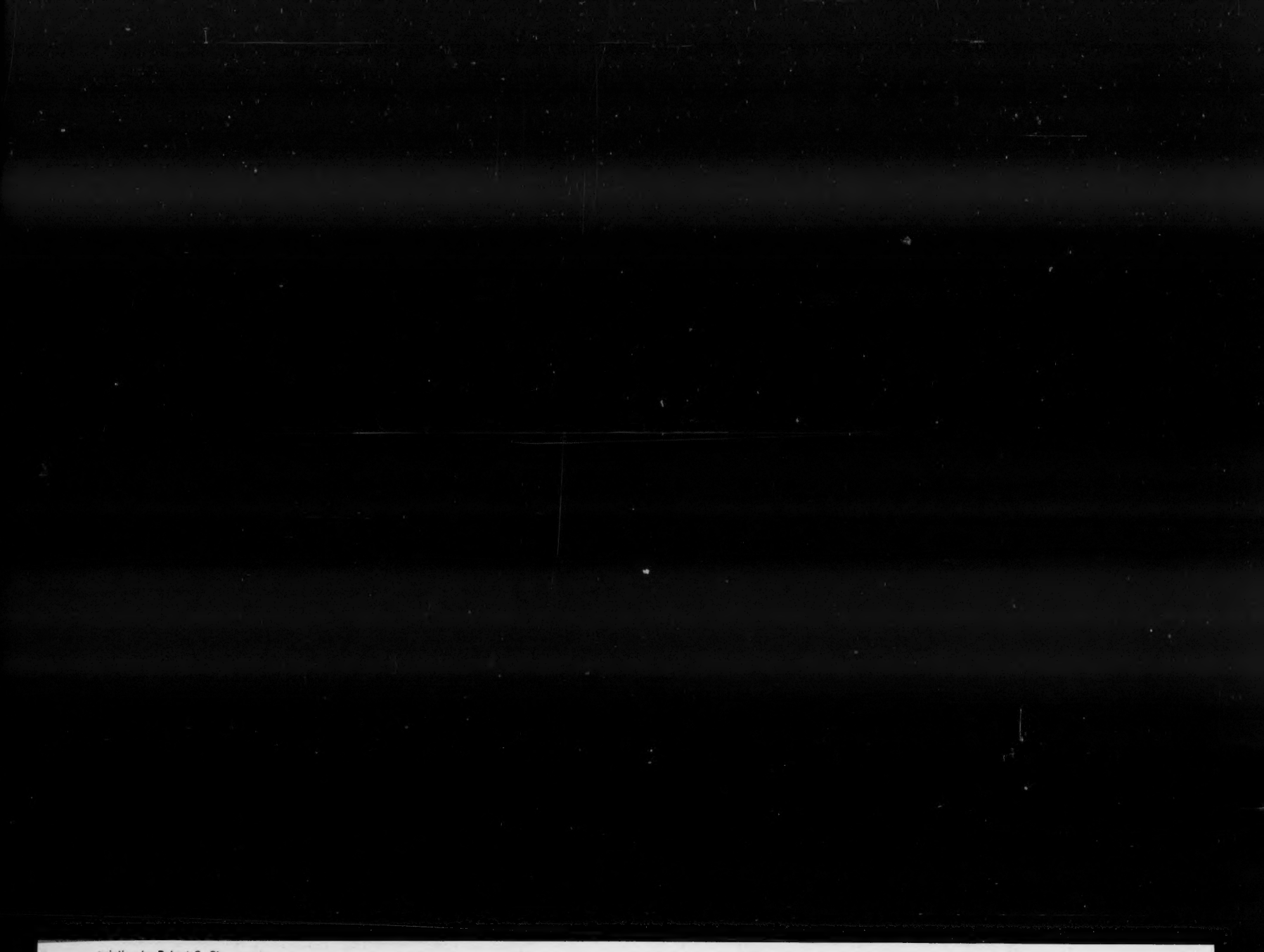
ATC expertise is provided to all DARR offices by the assignment of a senior ATC noncommissioned officer, military occupational specialty (MOS) 93J, or warrant officer ATC technician, MOS 150A. The DARR interfaces with the FAA regional staff on Army ATC facility operations, facility letters of agreement, and the appointment of Army control tower operator examiners. ATC unit commanders, to include Reserve Components, are encouraged to contact the DARR to assist in planning ATC support of exercises which will use the National Airspace System. ATC facility chiefs can obtain regional or national interpretations of ATC matters from the DARR.

In addition to the DARR responsibilities concerning airspace, Aviation and ATC matters, each DARR assists the Aeronautical Information Division at USAATCA-ASO in matters concerning Department of Defense flight information publications products and the information contained in these products.

Lastly, the DARR represents the Department of the Army at the FAA regional level. Each DARR is appointed by the Adjutant General to carry out the official duties of the office and has a direct line of communications through the director, USAATCA-ASO to the Office, Deputy Chief of Staff for Operations and Plans, at the Department of the Army.

Specific questions concerning DARR activities should be directed to Mr. John McKeeman at AUTOVON 284-7796/6304 or Commercial (202) 274-7796/6304.

Readers are encouraged to address matters concerning air traffic control to: Director, USAATCA Aeronautical Services Office, Cameron Station, Alexandria, VA 22304-5050.

painting by Robert C. Sherry

Your individual contribution of $100 entitles you to receive a set of 12 reproduced paintings of Army aircraft signed by the artists; and you also will become a life-time member of the Museum Foundation.